THE AGRICULTURAL PROBLEM IN THE UNITED STATES

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NATIONAL INDUSTRIAL CONFERENCE BOARD, Inc.
NEW YORK
1926

Published April, 1926

FOREWORD

THE position of American agriculture is of vital concern to all the people of the United States, not only for today but for the future as well. Our farmers are more than a class of our population. Farming is more than an industry. The significance of agriculture in the life of the nation is far deeper than this. It touches something vital and fundamental in the national existence. It involves the national security, the racial character, the economic welfare and the social progress of our people.

The development of sound, far-sighted national policies in respect to agriculture is, therefore, one of the most important problems before the country today. Our agriculture is now going through a crucial transition in its character and in its relationship to our national economic life. The success or failure of this readjustment will be of the greatest significance for our future. We have as a people to determine deliberately and wisely the rôle which we wish to have agriculture play in our national economic life, in the light of full knowledge as to whether and in what respects its position is weak and why, and on the basis of sound judgment as to how it can best be strengthened.

In the development of such policies and the determination of such questions it is the duty of all groups to take part. Such participation will be fruitful in so far as it is based on a common understanding of the complex problems and mutual adjustment of the diverse interests involved.

For these reasons the National Industrial Conference Board, as an organization for the study of questions affecting the welfare of American industrial-economic life, has undertaken in this report to examine the main features of the agricultural problem in the United States. Its primary purpose is to clarify the problem as a whole so as to contribute to a better and more general understanding of it not only by American industry, but by the general public, and so to

provide a common basis for such sound policies as may assure the country a prosperous agriculture as a part of a prosperous national economy.

This report is the result of an investigation conducted by Mr. Virgil Jordan and assistants, of the Conference Board's Research Staff, under the supervision of the Board's Staff Economic Council.

In the preparation of its studies the National Industrial Conference Board avails itself of the experience and judgment of the business executives who compose its membership, and of recognized authorities in special fields, in addition to the scientific knowledge and equipment of its Research Staff. The publications of the Board thus finally represent the result of scientific investigation and broad business experience, and the conclusions expressed therein are those of the Conference Board as a body.

The Conference Board is greatly indebted to numerous farm leaders, business executives, economists and others especially familiar with agricultural conditions for their many helpful suggestions and criticisms in connection with this study. The Board is under special obligation to the members of its Advisory Committee on Agriculture, whose close co-operation has been invaluable, viz.:

Frederick P. Fish, of Fish, Richardson & Neave, Boston, Mass.
Charles Cheney, President, Cheney Brothers, South Manchester, Conn.
W. I. Drummond, Chairman, The American Farm Congress, Kansas City, Mo.
Howard Elliott, Chairman, Northern Pacific Railway, New York City.
Alexander Legge, President, International Harvester Co., Chicago, Ill.
Frank O. Lowden, Sinnissippi Farm, Oregon, Illinois.
H. C. McKenzie, New York State Farm Bureau Federation, Walton, N. Y.
Elwood Mead, Commissioner, Bureau of Reclamation, U. S. Department of Interior, Washington, D. C.
John R. Mitchell, Chairman, Federal Reserve Bank of Minneapolis, Minneapolis, Minn.
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S. H. Thompson, President, American Farm Bureau Federation, Chicago, Illinois.

Owen D. Young, Chairman, General Electric Company, New York City.

Magnus W. Alexander, President, National Industrial Conference Board, New York City.

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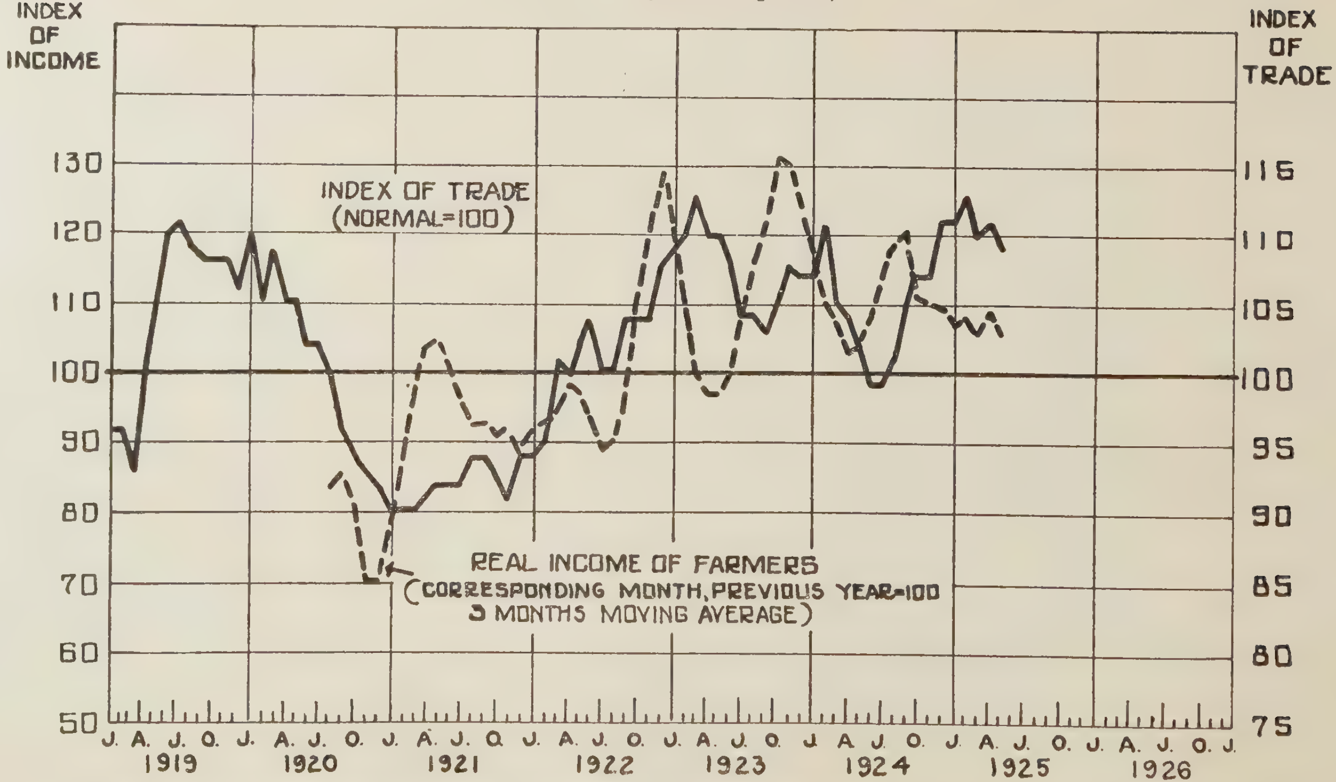
Changes in Real Income of Farmers and Total Volume of Trade, 1919–1925

(Source: U. S. Department of Agriculture)



This chart illustrates the close connection between changes in the purchasing power of farmers and changes in general business activity. The index of the physical volume of trade represents combined variations in a large number of business indicators, as computed by Carl Snyder of the Federal Reserve Bank of New York (*Journal of the American Statistical Association*, Sept., 1925). The index of farmers' real income represents cash income from marketings related to change in prices of non-agricultural commodities, and further adjusted for seasonal variations by comparing each monthly value with that for the corresponding month of the preceding year.

THE AGRICULTURAL PROBLEM IN THE UNITED STATES

CHAPTER I

INTRODUCTION

The Importance of the Problem

As city populations grew and as their economic life became centered in the factory, the office, the store and the bank, public opinion became urbanized and popular attention was concentrated more and more upon problems of industry, trade and finance. New forms of industrial, financial and commercial organization developed and enlisted the chief concern of the productive population and of government. The mind of our people has been occupied with the problem of creating the vast industrial society that has grown up on this continent. Our land resources have hitherto been so abundant that we have given little thought to the problem of their utilization. The agricultural consciousness of the people at large has become less intense, even though the government has increasingly devoted special attention to the technical aspects of agriculture, and has sought to foster it in various ways.

This change has had important consequences for the national economic, social and political life. On the one hand, understanding of the peculiar problems of agriculture and appreciation of their importance have been subordinated in the public mind. The industrial or business population has become preponderant not only in numbers but in interest, organization and influence, while agriculture has become only a relatively remote concern and its welfare largely taken for granted in urban thought. On the other hand, the agricultural population has tended to remain economically, socially and politically a group apart, relatively unorganized and ineffective in both its thought and its active rôle in the national life.

Yet, as will be emphasized in what follows, these two groups have at the same time become more closely interdependent, and the need for closer attention to the agricultural situation, for more general understanding of the problems it presents, and for special effort toward general cooperation in their solution, has become greater for a number of reasons.

Its Economic Significance

In the first place, there is the reason of direct self-interest. Although agriculture has taken second place in our total productive life, it is still a large and often a determining factor not only in the general economic welfare, but particularly in the prosperity of the urban classes.

The agricultural industry exercises normally a purchasing power of nearly ten billion dollars annually for goods and services produced by others.[1]

It purchases about six billion dollars' worth of manufactured products annually, or about a tenth of the value of the manufactured goods produced.[2]

It supplies materials upon which depend industries giving employment to over half of our industrial workers.[3]

It pays indirectly at least two and a half billion dollars of the wages of urban employees.[4]

It supplies about an eighth of the total tonnage of freight carried by our railroad system.[5]

Its products constitute nearly half of the value of our exports.

It pays in taxes about one-fifth of the total cost of government.[6]

Our farms and farm property represent nearly one-fifth of our tangible national wealth, and agriculture has con-

[1] Including cash wages paid to hired labor, interest, taxes and rent, but not the cost of transportation. See pp. 19, 103 of this volume for items and sources.

[2] Excluding such purchases by hired farm laborers. See pp. 19, 103.

[3] Based on 1923 Census of Manufactures.

[4] Based on the proportion which wages constitute of the value of the products purchased and of taxes and transportation paid by agriculture. See pp. 19, 103, 128.

[5] Excluding forest products.

[6] National Industrial Conference Board, "Tax Burdens and Exemptions," New York, 1923.

tributed in recent years about one-sixth of the national income.[1]

The current value of the total capital invested in agriculture in 1919–20 was $79 billions as compared with $44 billions invested in manufacturing industries, $7 billions in mines and quarries, and $20 billions in our railroads in 1919.[2]

Moreover, with the rapid development of industrial production and the increasing pressure for domestic and foreign markets, the purchasing power of the agricultural population, which buys about one-tenth of the value of our total manufacturing production, may be a determining factor in industrial and business prosperity. The frontispiece chart on page xiv suggests not only that there is a close relationship between the changes in the purchasing power of the farmers' income and changes in the volume of trade, but also that fluctuations in the farm purchasing power appear in recent years to have preceded fluctuations in business conditions.

Finally, it must be remembered that, as our industries rely so greatly upon agriculture for their basic materials,[3] industry has a direct interest in the maintenance of an adequate and well-proportioned agricultural production, unless we are to become dependent upon foreign countries not only for the food supply of our industrial workers but for many industrial materials.[4] The era of land abundance has gone. The nation as a whole must in the future take thought regarding the conservation and wise utilization of its irreplaceable land resources, which are the basis of our economic life.

Its Social Significance

Secondly, it must be realized that in the agricultural

[1] Figures of wealth relate to 1922; those of income, to the period 1909–1919. See Tables 14, 15.

[2] U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, July, 1925, p. 236; U. S. Department of Commerce, Abstract of Census of Manufactures, 1919, p. 12; and Statistical Abstract of the United States, 1924, pp. 365, 682.

[3] Excluding forest products, approximately 35% of the materials used in manufacturing industries (in terms of value) are domestic agricultural products.

[4] The tendency toward monopolistic control of certain raw materials by foreign countries gives special emphasis to this point as a matter of long-time economic policy, unless international economic relations are to become quite different from what they have been in the past.

problem we are dealing not only with the economic position but with the physical and social welfare of nearly thirty-two millions of people who constitute nearly one-third of our total population. We must remember that this enormous group of human beings constitutes the reservoir from which will inevitably be drawn a large part of our future citizens. The average size of their families is larger than for the rest of our population, and their welfare must strongly affect the vitality of our racial stock. The farm in the past has been the main source of our free and self-reliant national type, and a radical change in this respect may have an important influence upon American society in the future. Our farms are more than work places: they are homes. Agriculture is not merely an industry; in a broad sense it is a social institution. The farm population, once disintegrated, is not easily replaceable out of the city, as some European nations have discovered.

Its Political Significance

Thirdly, it must be emphasized that economic and social conditions among this large group are inevitably reflected in the national political life. American history bears ample evidence of the significance of this fact. Agrarian agitation and unrest in many forms has been a recurrent feature of American political development. The city versus the country has been a dominant political motif in the history of the United States, as of other industrial countries, since the beginning of our industrial era. The character and basis of this conflict have altered with changes in our industrial and agricultural life, but the conflict has remained. The rapid rise of industrialism created the sources of political unrest and agitation in the urban and industrial populations, but so long as agriculture was dominant and self-sufficient, the agricultural group tended to be conservative in its political outlook. With the increasing importance of industry and the changed position of the industrial population, particularly as it has been recently affected by the diffusion of ownership and participation in industrial enterprise, and the development of industrial, commercial, financial and labor organization, the urban population has tended toward

greater conservatism in political action. But the agricultural group, relatively unorganized in productive, commercial and financial relations, more and more subordinated in its economic position and increasingly influenced by industry, finance and trade, has tended to develop new group attitudes in political questions, such as taxation, the tariff, railroad regulation and other matters affecting its economic position. The inherent conservatism of the individualistic landowner has been altered by the growth of tenancy and by the great instability and disparity of his economic position as agriculture and industry have become more closely interrelated. Since this growing economic interdependence requires greater political unity, it is important that industry clearly understand the economic roots of the political conflict which, in various forms, has frequently obscured the mutual interest of agriculture and industry.

Its Relation to National Policy

Finally, it must be realized that the current political, social and economic problems arising in connection with agriculture are really reflections of the changing position and relationships of agriculture in our national economic development. In order to cope with these problems, it is necessary to understand not only what they are and how they have arisen, but to formulate a clear conception of the direction which it is desirable that our national development should take in the future. All these problems converge ultimately toward the question of developing a national economic policy which shall embrace all aspects of our economic life in a unified whole and allot to each its place, in the light of long-time considerations of national security, social unity and economic justice. The choice of this policy, in so far as it can be made deliberately and consciously, is momentous for our future prosperity and growth. Casual adjustment and drifting in matters of such vast significance lead inevitably to more and more serious difficulty as time goes on.[1] Through

[1] Even in Great Britain, the oldest nation, industrially, the problem is still a live one, as is illustrated by the land program which Lloyd George has advanced as a political issue. The need of a revival of agriculture is there being urged on grounds of national security, for the relief of industrial unemployment, to create better domestic markets for industrial products, and as a means of improving the character

mutual understanding and co-operative effort on the part of both industry and agriculture, it may be possible to find and formulate a common basis of policy in which considerations of national security, economic prosperity, social welfare and political unity are balanced, and a consistent guide provided to legislative action affecting both industry and agriculture. From the point of view of national policy it is not only necessary that there be mutual understanding and co-operative effort between agriculture and other branches of our economic life: there must also be an equitable adjustment and balance between all branches. It would be economically, socially and politically disastrous to the nation if, through neglect or indifference, any remediable disparity that may be found to exist in the position of so large a group as our farm population be permitted to continue or to become progressively sharper. Equality of opportunity for all is vital to the prosperity of each.

The Aspects of Agriculture

Agriculture is a peculiar, complex, diverse and widely changing industry. It is impossible to treat of it adequately in terms of the characteristics of other industry, or in terms of conditions in particular branches, localities or periods of time. In attempting to understand its position, therefore, it is important to start with a clear picture of what is involved in dealing with it and to select for consideration those aspects of the subject which are most important.

The Agricultural "Plant"

In the first place, it must be remembered that in studying the position of agriculture we are dealing fundamentally with the utilization of our land resources. These land resources are limited in extent. They are replaceable only to the extent that their fertility—that is, the minerals, humus

of the people, whose initiative, adaptability and self-reliance are felt by many to have been weakened by excessive urbanization. Italy, France and most other European countries are attempting to stimulate domestic agriculture again for similar reasons, feeling that the swing to industrialism has gone too far. See, for example, *Economist*, London, Sept. 26, 1925, p. 483; also Glasgow Chamber of Commerce, *Monthly Journal*, Oct., 1925, p. 153.

and plant foods in them—is restored. In short, we are dealing, in the last analysis, with the chemical and biological resources of our soil. Our agriculture may be regarded, therefore, as an industry of which the materials are the soil resources, and the industrial "plant" such part of the fixed area of our land as is brought under cultivation. It is with these materials and this "plant" that human labor, science and nature work together to produce the food and clothing and other industrial materials which are the fundamental basis of our life. Consequently, in studying the position of agriculture, we must keep ever in mind the situation as to the changes in the soil resources and in our cultivated land area or agricultural "plant," which are the basis of the industry.

Natural Forces

In the process of agricultural production on this basis it must be remembered that natural forces still play a larger rôle than human labor or science. The rainfall, the temperature, the wind, the sun and the chemical processes going on in the soil, plant diseases and pests, all finally determine the operation of the "plant." Nature is the ultimate management in the agricultural industry. The scope for human action is undoubtedly wide, and continually expands as scientific knowledge grows. But, so far, certain fundamental factors like weather have remained beyond human control, and in consequence the productive process in agriculture remains in large part a gamble. Agricultural production, therefore, is inevitably unstable. This does not necessarily mean, however, that the economic position of those engaged in the industry is inevitably insecure or unsound, for the *effects* of the instability of the productive process depend chiefly upon human intelligence and ingenuity. In studying the position of those engaged in agriculture, therefore, it is necessary to distinguish between the fluctuations from year to year which result from the instability of agricultural production, and the fundamental trend or tendency in the position of the industry as it is affected by the factors of land area, replacement of soil resources, the number of workers in it, the costs of production, the demand

for its products and their distribution and exchange—all of which are in some measure subject to human influence.

Human Interests Involved

Next, it must be remembered that in the utilization of these land resources the human interests directly involved are peculiar and diverse. Partly because of the economic characteristics of the industry, those engaged in it are peculiarly individualistic, self-reliant and unaccustomed to group action either in their productive or in their business relations. Furthermore, the farmer is at once an investor, a business man or enterpriser, a worker and a direct consumer of his products. Agricultural production involves at once a way of living of a group of our population, an occupation of a portion of our working population, an employment of a portion of our employed laborers, an enterprise engaged in by a group of our business men or enterprisers, and finally an investment of a portion of our capital. Although all these aspects of the industry are inseparable and are interwoven in differing degrees in different parts of the industry, it is important in discussing the agricultural problem to distinguish between the problems of the farm population, those of the farmer as a producer or worker, those of the farmer as an investor, and those of the farmer as a business man or trader. Moreover, the industries or types of production in which all these diverse interests are involved are also widely different. In studying the position of our agriculture today it is therefore important to understand the make-up of the industry as a whole in these various respects, and to note those which are most important.

Rural and Farm Population

The rural population is, of course, not the same thing as the farm population. In 1920 the rural population comprised 51,406,017 persons, or 48.6% of the total population. Although this group is more closely related to agriculture than is the urban population, it comprises persons living in towns and incorporated places of less than 2,500 inhabitants as well as on farms, and depending upon other occupation, business or investment as well as upon agriculture. The farm popu-

lation itself in 1920 comprised 31,614,269 persons, or 29.9% of the total.[1] It is concentrated chiefly in the South Atlantic, West North Central, West South Central and East South Central states. As Table 4 shows, in these sections nearly 70% of the total farm population is found. In each of the two last-mentioned sections the farm population formed over 50% of the total population.

The Working Force

Those engaged in agriculture as an occupation formed, in 1920, 26.3% of the total gainfully occupied population, or somewhat less than the proportion which the farm population formed of the whole. Moreover, the percentage of the farm population reported as gainfully occupied in 1920 (34.6%) was less than the percentage for the population as a whole (39.4%) and considerably less than the percentage of the non-farm population which was gainfully occupied (41.4%). This is a reflection partly of the fact that the number of children in farm families is larger than in city families and partly of the fact that a large number of children engaged in assisting the family labor are probably not fully reported as gainfully occupied.[2]

Wage Earners

Those engaged in agriculture as an occupation or business or investment include groups of very different status and interest, running from corporations operating, through salaried employees, large farms, ranches or forests, down to farm laborers who are paid a cash wage in addition to their maintenance. Between these groups are found "croppers" who work land for a share of the produce, which is practically a wage; tenants who rent land and pay for it partly or wholly in cash; owners or part owners who operate farms them-

[1] U. S. Fourteenth Census, 1920, Vol. V, p. 892. A more recent estimate by the Department of Agriculture on January 1, 1926, puts the farm population at 30,655,000, indicating a net decline of nearly a million since 1920, and of 479,000 during 1925 alone.

[2] The change in the date on which the census was taken in 1920 doubtless accounts for part of the discrepancy. By adjusting the census figures for 1920 to take account of this change, the Department of Agriculture estimates the gainfully occupied in agriculture in 1920 at 12,065,356, or nearly 29% of the total gainfully occupied. On this basis 38.1% of the farm population were gainfully occupied.

selves or with hired labor, tenants or "croppers"; and persons who work farms under numerous variations and combinations of these forms of tenure.

Those who are mere wage earners are numerically the largest group, but they form a far smaller proportion of the gainfully occupied in agriculture than in manufacturing industry. This may be seen by comparing the distribution of the gainfully occupied in agriculture in 1920 with that of the gainfully occupied in manufacturing in the nearest comparable year, 1919, as follows:

Agriculture[1]		*Manufacturing*[2]	
Farm laborers	39.4%	Wage earners	84.1%
Owner farmers and farm managers	37.5%	Proprietors, firm members, officers, managers and salaried employees	15.9%
Tenant farmers	23.1%		

Proprietors

Agriculture is predominantly a proprietary industry. Excluding farm laborers, it is seen from the following table that most of the farms, most of the farm land, and most of the farm property in 1920 were operated by individual owners or part owners.[3]

TABLE 1: TENURE OF FARMS AND FARM PROPERTY, 1920

Class	No. of Farms	Per Cent	Per Cent of all Land in Farms	Value of all Farm Property	Per Cent
Owners	3,366,510	52.2	48.2	$36,837,394,179	47.3
Part Owners[1]	558,580	8.6	18.4	10,774,151,765	13.8
Managers	68,449	1.1	5.7	3,132,273,005	4.0
Tenants	2,454,804	38.1	27.7	27,180,281,389	34.9
Total	6,448,343	100.0	100.0	$77,924,100,338	100.0

[1] Those hiring land in addition to what they owned.

Tenants

Next to farm owners, tenants are the most important group engaged in farming. Tenants on a share or share-cash

[1] U. S. Department of Agriculture, Yearbook, 1923, p. 511.

[2] U. S. Census of Manufactures, 1919, Abstract, p. 392.

[3] U. S. Fourteenth Census, 1920, Vol. V, pp. 124, 129, 130. Preliminary figures rom the farm census of 1925 show a decline of 76,726 in the number of farms since 1920. The number operated by owners and part-owners declined 56,666, and the percentage of all farms operated by tenants increased from 38.1% to 38.6%.

basis operated 28% of the number of farms, forming 24.6% of the total value of farm property, while tenants on a cash basis worked about 9% of the number of farms, valued at about the same proportion of the total value of all farm property in the country.[1] While it is not pertinent here to discuss the important question of the changes that have taken place in farm tenure, and the relation of these to agricultural conditions, it may be mentioned that between 1910 and 1920 the number of farms operated by owners decreased slightly, while large increases took place in the number operated by managers and share and share-cash tenants, and a considerable decrease in the number worked on a cash rental basis.[2] It should be remembered, too, that the proportion of farms and farm wealth under these various forms of tenure varies greatly among the states. In some of the Southern and South Central States over 60% of the number of farms are operated by tenants, mostly on a share basis, and in some states more than 40% of the value of farm property is under tenant tenure.[3] Table 4 shows that the percentage of farms operated by tenants was highest in the dominantly agricultural sections, ranging from 34% in the West North Central to 53% in the West South Central sections.

Nativity

Most of the farm operators are native born, but tenancy is more marked among the native born farm operators than among the foreign born, and most marked among the negro farmers, as may be seen from the following comparisons for 1920:[4]

	All Farm Operators	*Tenant Farmers*
Native white	76.3%	66.4%
Foreign born white	9.0%	4.5%
Colored	14.7%	29.1%

	Native White Operators	*Foreign Born White Operators*	*Colored Operators*
Tenants	33.2%	18.9%	75.2%
Owners	65.6%	79.9%	24.6%

[1] *Idem.*
[2] *Ibid.*, p. 124; see also p. 125 of this volume.
[3] *Ibid.*, p. 160.
[4] *Ibid.*, p. 295.

Number and Size of Enterprises

Regarded as an investment, American agriculture is still predominantly an individualistic or family enterprise. The corporate or communal organization of agriculture is as yet of small importance; there were less than 8,000 farming corporations in 1923.[1] To a much larger extent than is true in European countries, the farmer lives upon and owns his land. The family farm is practically universal, and such organization as there is in the industry applies chiefly to certain aspects of the external business relations of a great number of independent family enterprises.

The number of these individual or family enterprises in agriculture, nearly 6½ millions, is greater than that of all other kinds of enterprises, industrial, mining, commercial and financial, combined. Their average value amounted in 1920 to $12,084, as compared with an average investment per manufacturing enterprise of $153,000 in 1919.[2] The average investment per farm operated by owners or part-owners in 1920 was about $8,000. The average size of "establishment" was 148.2 acres, of which 78 acres were improved and 26 acres in wood lot. This is much larger than the average agricultural productive unit in European countries; but there are a large number of small farm enterprises in this country, as may be seen from the following figures for 1920:[3]

Size of Farm	*Number of Farms*	*Per Cent of Total*
Under 10 acres	288,772	4.5
10–19 acres	507,763	7.9
20–49 "	1,503,732	23.3
50–99 "	1,474,745	22.9
100–174 "	1,449,630	22.5
175–499 "	1,006,477	15.6
500 acres and over	217,224	3.3
Total	6,448,343	100.0

[1] U. S. Treasury Department, "Statistics of Income, 1923," Washington, 1925, p. 79.

[2] U. S. Census of Manufactures, 1919, Abstract, p. 12.

[3] U. S. Fourteenth Census, 1920, Abstract, p. 606. Preliminary figures from the farm census of 1925 show that the average acreage per farm declined from 148.2 acres in 1920 to 145.2 in 1925.

Capital Borrowed

From the point of view of those engaged in agriculture as a business, the most important difference in status besides tenure is the extent of mortgage indebtedness. As will be apparent later, the significance of this factor in the business position of the farmer has in some periods been greater than that of tenure. For the farms operated by owners or part owners reporting (i. e., about 60% of all farms) the Census of 1920 showed 47.2% to be mortgaged and 52.8% to be free of mortgage. The real estate mortgage debt on *all* mortgaged farms in 1920 was 29% of the value of the land and buildings as estimated by the Census. The total debt was estimated at $7,857,700,000. The average debt per owner-operated farm reporting was $3,356, as compared with an average value of $11,546 per farm.[1]

Branches of Production

Probably the most important difference among those engaged in agriculture which influences their problems and interests is the kind of agricultural production—or the branch of the agricultural business—to which the land and equipment are chiefly devoted. The acreage allotted to the various crops is a general indication of this, although it must be remembered that few if any farms are devoted to any single kind of production, and the kind of business chiefly engaged in varies widely from section to section and state to state, and is continually changing. In this respect the Census shows that in 1919, 69.3% of the improved land in farms was devoted to crops, the remainder being used chiefly for orchards, wood-lots, vineyards, pasture, building, yards, gardens, etc. Of the land in crops, 25.2% was used for corn, 23.4% for hay and forage, 21.0% for wheat, 10.9% for oats, 9.7% for cotton, 2.2% for rye, 1.9% for barley, and 1.6% for vegetables.[2] Of the six and a half million farms, more than six million raise farm animals of some kind for home use or for sale.

[1] U. S. Fourteenth Census, *op. cit.*, Vol. V, p. 492 ff.; also p. 121 of this volume.

[2] Fourteenth Census, *op. cit.*, Vol. V, p. 701.

The acreage of the principal crops in 1924 was as follows:[1]

Hay and forage (including corn and sorghum cut for silage)	82 857,297
Corn	82,316 967
Wheat	50,882,142
Cotton	39,204 319
Oats	37,845,615
Barley	6,711,850
Grain sorghum	3,931 727
Rye	3,755,468
Flax	3,440,297
Potatoes (including sweet potatoes)	3,417,871
Beans (Navy and velvet beans)	3,216,246
Tobacco	1,538,991
Peanuts	1,365,992
Sugar beets and cane	1,081,046

The wide differences between the acreages of the first five crops and that of the others is of the utmost significance in the agricultural problem, since the shifting of a relatively small proportion of the former area to the latter may make relatively little difference in the production of the major crops but very great increases in the minor ones.[2]

A better indication of the diversity of interests within the industry is afforded by the value of the output of the various branches. The relative value of the various major commodities *produced* by the industry, at prices received by farmers in 1924, is shown in Table 2.[3]

TABLE 2: RELATIVE VALUE OF PRINCIPAL AGRICULTURAL COMMODITIES PRODUCED, 1924

	Value (Millions)	*Per Cent of Total*
Total gross value of crops and animal products	$17,356	100.0
Total Crops	11,404	65.7
Corn	2,890	16.7
Wheat	1,131	6.5
Oats	799	4.6
Hay and forage	1,733	10.0
Cotton	1,701	9.8
Vegetables	1,018	5.9
Total Animal Products	5,951	34.3
Animals raised	2,267	13.1
Swine	1,008	5.8
Cattle	944	5.4
Dairy Products	2,586	14.9
Milk	1,714	9.9
Poultry Products	994	5.7

[1] Preliminary figures from farm census of 1925.

[2] See pp. 72, 79.

[3] U. S. Department of Agriculture, Yearbook, 1924, pp. 1113–4.

It is thus evident that, from the standpoint of the products *produced*, the most important parts of the industry are the production of corn, hay and forage, milk, cotton, wheat, vegetables, hogs, poultry and cattle.

Of this total, however, crops to the value of $4,592 millions were fed to livestock, used for seed or wasted, and products to the value of $2,359 millions were consumed on the farm for family uses, leaving a total of about $10,400 millions of products which may be considered to have been sold outside the industry.[1] This is the production upon which the position of agriculture as a business depends today, for it is out of the sale of these products that the cash expenditures of the industry must be paid. From the point of view of agriculture as a business, therefore, the make-up of the industry is best indicated by the relative value of the products marketed externally.

Of thirty major farm products, the total value of which was 90% of the total sales reported by the Census of 1920, the largest in *sales value* at 1924 prices are shown in Table 3.[2]

Table 3: Relative Value of Principal Agricultural Commodities Sold, 1924

Product	*Per Cent of Total Sales Value*
Cotton (and seed)	22.2
Hogs	11.0
Cattle	10.5
Wheat	9.3
Milk	9.1
Corn	6.6
Butter	4.6
Eggs	4.1
Tobacco	3.9
Potatoes	2.4
Oats	2.4
Hay	2.2
Apples	1.8
Calves	1.4
Lambs	1.4
Chickens	1.2
Wool	1.1

[1] The Department of Agriculture estimates that the following percentages of the various crops were fed to livestock: Forage, 100%; hay, 85%; grain sorghums, 90%; corn, 85%; oats, 80%; barley, 75%; rye, 20%; sweet potatoes, 15%; potatoes, 10%; wheat, 6%. There is still some duplication involved in this calculation because part of the milk is fed to livestock, but this figure may be taken as the maximum of the value of products available for external sale.

[2] U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, August, 1925, p. 279. These figures are based on the average quantities marketed during the five-year period, 1918–23.

It is thus seen that while the production of corn, hay and forage, milk, cotton and wheat are the most important interests in agriculture from the point of view of the farmer as a producer, from the point of view of the farmer as a business man, dependent upon exchange of his surplus[1] product, the order of importance is somewhat different. Cotton leads, with dairy products next, and hogs, cattle, wheat and corn following in order.

Geographical Concentration

Finally, the question arises as to how these different interests in the industry are localized geographically. It is obvious that in respect to the importance of the farm population and of those engaged in agriculture as a business, and in respect to their status and tenure, their mortgage indebtedness, and the principal lines of agricultural business to which their land and equipment are devoted, the situation is different in each state and section of the country.

Table 4, following, will serve to indicate in a general way the geographical distribution of the industry from the various aspects that have been pointed out in the foregoing discussion.

From this table it is clear that the agricultural industry is divided into two main branches, each concentrated in a different section of the country—the South Atlantic and South Central States, in which the cotton industry is located, and the North Central States, in which the production of wheat, corn and dairy products is concentrated. Nearly a third of the total farm population live in the North Central States; 30% of the total gainfully occupied in agriculture are located there; these sections include 58% of the total value of the farm property, and 54.5% of the total land in crops. In these states, too, the proprietary interest in the industry, as indicated by the percentage of tenancy, was greater than in the South Central and South Atlantic States. In the South Central States there is a greater concentration of human rather than of economic interests in agriculture. The percentages of the total farm population, of the total working population dependent upon agriculture, of the agricultural workers and of the number of farms, are high; but

[1] That is, the surplus above his own needs.

Table 4: Geographical Distribution of Agricultural Interests, 1920[1]

Division	Per Cent of Total Farm Population	Per Cent of Working Population in Agriculture	Per Cent of Total Agricultural Workers	Per Cent of Total Farms	Per Cent of Total Value of Farm Property	Per Cent of Total Land in Crops	Per Cent of Farms Operated by Tenants	Per Cent of Total Cotton Produced	Per Cent of Total Dairy Products	Per Cent of Total Swine	Per Cent of Total Cattle	Per Cent of Total Wheat Produced	Per Cent of Total Corn Produced
New England	1.98	7.90	2.3	2.43	1.5	1.2	7.4	..	6.66	0.65	1.98	0.06	0.24
Middle Atlantic	5.99	7.15	6.0	6.59	5.1	4.9	20.7	..	20.15	3.25	5.80	3.59	3.60
East North Central	15.54	19.19	14.9	16.82	22.1	18.0	28.1	..	30.28	23.90	16.35	21.36	29.13
West North Central	16.36	36.82	15.4	17.01	35.9	36.5	34.2	0.56	17.76	36.59	30.27	44.78	38.18
South Atlantic	20.30	40.78	20.0	17.97	7.9	9.1	46.8	35.70	5.98	11.01	7.06	3.47	9.08
East South Central	16.39	54.52	16.5	16.31	5.7	7.7	49.7	17.45	4.73	10.46	6.83	1.80	9.55
West South Central	16.54	48.65	16.5	15.45	9.8	14.5	52.9	45.31	4.85	9.70	15.16	11.03	9.30
Mountain	3.69	34.04	3.9	3.79	5.2	4.5	15.4	0.57	2.77	2.01	11.40	5.63	0.71
Pacific	3.21	20.57	4.5	3.63	6.8	3.6	20.1	0.41	6.81	2.43	5.15	8.27	0.22
United States	100.00	26.32	100.0	100.00	100.0	100.0	38.1	100.00	100.00	100.00	100.00	100.00	100.00

[1] U. S. Census of Agriculture, 1920.

the proportion of the total value of farm property is relatively small. Even within these sections there is considerable further specialization, as, for example, in dairying, flax, sugar, fruit or tobacco production, which has greatly influenced the effect of changing conditions upon the agricultural population. It is evident, however, that, generally speaking, the bulk of the agricultural interest is concentrated in these sections, and conditions affecting the industry in these states determine in large part the picture for the industry as a whole.

Exchange Relations with Other Industries and Groups

It is clear from the foregoing description that agricultural production today is a highly specialized and localized industry. Only a small part, if any, of the diverse interests involved in it can be considered to be wholly self-sufficient. Nearly all are engaged in mass production of single or relatively few commodities far in excess of what they themselves require, and which have to be exchanged in distant markets for the balance of their own requirements and for the reward of their labor and investment. Moreover, the various parts of the industry are themselves closely bound up together. The product of the grain producer is the raw material of the producer of dairy products and eggs and of the producer of livestock and poultry. Thus, the economic position of those engaged in industry is dependent not only upon the exchange of their product for the goods and services of other industries, but upon exchange within the industry itself. Both the value of the raw materials produced and used within the industry and the value of the finished products for sale outside the industry relative to that of the goods and services required by the industry from other groups, are fundamental in the economic position of the industry as a whole. The importance of these considerations in studying the position of our agriculture today may be illustrated by Table 5, showing the approximate "balance sheet" of the industry for the crop year 1924–25, and Table 6, showing the distribution of income from production during the period 1919–1925. From these tables it is clear that about 40% of the value of the products of agriculture is

consumed by the industry itself, while 60% of the gross value is exchanged to pay the external cash expenditures of the industry. Of the net value of the production, after materials produced and consumed for feed, seed, etc., are deducted, about 20% is consumed for family living purposes; and of the value of the product sold, nearly 60% is used to pay for products and services of other industries, including purchased living requirements.[1]

TABLE 5: APPROXIMATE DISTRIBUTION OF GROSS VALUE OF PRODUCTS OF AGRICULTURE, 1924–25[1]

	Amount (Millions)	*Per Cent*	
Gross value of products	$17,350[2]	100	
Used or sold within the industry			
For feed, seed and waste	4,600	26.5	
For family living	2,360	13.6	40.1
Sold outside the industry to pay for			
Property rented from non-operators	1,025	5.9	
Capital borrowed from non-operators	765	4.4	
Governmental services to operators	615	3.5	
Hired labor	1,205	6.9	
Products and services of other industries	6,780	39.2	59.9
	$17,350	100.0	

[1] This table is intended only as a general approximation. See pp. 20, 103.

[2] At prices received by farmers; i. e., after transportation and marketing costs have been deducted.

Organization

Finally, since our agricultural industry today is thus bound up with a network of highly organized industry, finance, trade and transportation, it is important to note the extent to which it is organized in relation to these other interests. Table 7 shows the extent and distribution of agricultural organizations for selling and buying in the various branches of the industry in 1924, and the business done by them in 1923.

This table indicates that in 1923, including all the co-operative agencies handling livestock, over two and a quarter billion dollars' worth of sales were handled by farmers' organizations. This was almost a quarter of the total business of the industry, i. e., of the value of the product sold to

[1] The whole of the remainder, after payment of taxes, interest, rent and wages, is here considered to be expended for products and services of other industries. See p. 103.

TABLE 6: DISTRIBUTION OF AGRICULTURAL INCOME FROM PRODUCTION, 1919–1925[1]

Item	1919–20	1920–21	1921–22	1922–23	1923–24	1924–25	Average
	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)
Gross income from production	$15,719	$12,668	$9,214	$10,366	$11,288	$12,136	$11,899
Per cent directly consumed	18.4	20.9	23.1	20.9	20.9	19.4	20.4
Per cent of cash income paid for[2]							
Wages to hired labor	11.6	17.3	15.4	12.9	13.5	12.3	13.7
Taxes[3]	3.0	5.5	8.2	7.5	6.9	6.3	5.9
Rent[4]	13.3	13.8	13.1	11.9	11.1	10.8	12.4
Interest[5]	6.2	8.9	11.8	9.9	8.7	7.7	8.5
Products and services of other industries, repairs, improvements, etc.	24.6	34.6	32.2	29.1	31.1	29.2	29.8
Per cent available for cash living expenses, etc.[6]	41.3	19.9	19.3	28.7	28.7	33.7	29.7

[1] U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, July, 1925. The value of the farmers' house rent is not included. See Table 16.
[2] After transportation and marketing costs are paid on product sold.
[3] Taxes on operator-owned investment only.
[4] Rent on property rented from non-operators.
[5] Interest on mortgage and other indebtedness held by non-operators.
[6] Part of this also goes for goods and services of other industries. See p. 103.

pay external expenditures. The proportion of the total product *sold* through organization was more than a fifth, while that of the goods and services of other industries *purchased* through organizations appears, so far as these figures go, to be only about 2% of the total. Since the figures of member-

TABLE 7: EXTENT AND DISTRIBUTION OF FARMERS' CO-OPERATIVE ORGANIZATIONS IN THE UNITED STATES[1]

Kind of Association	Number of Associations, 1924	Estimated Number of Members, 1924	Estimated Business in 1923: Amount	Per Cent of Total	Average Amount: Per Association	Per Member
			(Thousands)		(Thousands)	
Cotton	107	250,000	$100,000	4.5	$935	$400
Dairy products	1,966	200,000	400,000	18.2	203	2,000
Fruits and vegetables	1,232	200,000	300,000	13.6	244	1,500
Grain	3,134	400,000	600,000	27.2	191	1,500
Livestock	1,598	250,000	250,000[2]	11.4	156	1,000
Nuts	51	50,000	50,000	2.3	980	1,000
Poultry and poultry products	56	15,000	50,000	2.3	893	3,333
Tobacco	25	290,000	150,000	6.8	6,000	517
Wool	115	50,000	20,000	0.9	174	400
Miscellaneous selling	729	70,000	160,000	7.3	219	2,286
Merchandise (farmers' stores)	717	150,000	50,000	2.3	70	333
Collective buying	430	100,000	70,000	3.2	163	700
Total	10,160	2,025,000	$2,200,000[2]	100.0	$217	$1,086

[1] Source: U. S. Department of Agriculture, Bulletin No. 1302.

[2] Not including $200,000,000 of business by co-operative selling agencies in 19 livestock markets.

ship given involve considerable duplication it is clear that the proportion of farmers included in any of these types of organization is relatively small. Yet, from the average business per association, it is seen that some of them are large enterprises, among the largest being organizations handling tobacco, nuts and cotton.[1]

[1] The U. S. Department of Agriculture (*Agricultural Co-operation*, March 15, 1926) estimates that there are at present approximately 12,000 active farmers' co-operative associations in the United States, with a total membership of 2,700,000 as of January 1, 1926. At the close of 1925 the 8,256 associations from which information had been received by the Department reported a total membership of 2,386,061. This membership was distributed as follows: Grain, 490,000; dairy products, 374,000; livestock, 330,000; cotton, 300,000; tobacco, 300,000; fruits and vegetables, 125,000; wool, 47,000; poultry and poultry products, 31,000; nuts, 19,000; forage crops, 3,000; associations engaged in retailing activities, 100,000; miscellaneous selling, 135,000; miscellaneous buying, 125,000.

Summary

It is evident from the discussion in this chapter that in studying the agricultural problem we are dealing with a problem of national importance, but of the greatest complexity and diversity in its aspects. It involves political, social and economic considerations; it involves consideration of both the long-time trends and the periodic fluctuations in agricultural conditions; of the changes in our basic land and soil resources; of the position of the farm population and of farmers as workers, investors and business managers or traders; and of the position of groups of farmers of different forms of tenure, degrees of indebtedness, and different race, operating enterprises of different sizes and kinds in different sections of the country, under different conditions of distance from markets, organization, etc.

In studying, from the point of view of national policy, the complex questions involved, it may be assumed that the economic position of the industry as a whole and of the various groups involved in it underlies the political and social aspects of the problem. The most important questions to be considered, therefore, are:

1. The trend of the economic position of agriculture as a whole in respect to the relation between those engaged in it and our land resources, on the one hand, and their relation to the rest of our economic life, on the other hand.
2. The current position of agriculture from the point of view of the rewards of those engaged in it as workers and investors.
3. The economic position of the most important groups of farmers, namely, those engaged in the most important branches of agricultural production—cotton, corn, wheat, hog and cattle raising and dairying—in those sections where these branches of the industry are most concentrated—the East and West North Central and the South Atlantic and South Central States.
4. The factors underlying the current position of agriculture as a whole and its most important branches and geographical sections.

In the following chapter the first three of these are dealt with, and the fourth is discussed in the succeeding two chapters.

CHAPTER II

THE ECONOMIC POSITION OF AGRICULTURE

The discussion in the preceding chapter has shown that, in dealing with agriculture today, we are concerned with the relation of a group of our population and of a portion of our working population to the land resources of the country, on the one hand, and to the rest of our population and productive life, on the other. Our farmers today make a living by utilizing our land resources to supply the remainder of the population with food and industrial materials. Our land is our agricultural "plant"; the agricultural population is the direct labor force available for operating this "plant"; and the rest of the population is the market for their products and the source of the larger part of their requirements. The economic position of agriculture as an industry is determined fundamentally, first, by the relation of the agricultural producers to our land resources, and, second, by their relation to our industrial, commercial and financial organization through which both the value of their product and its costs of production are determined. To understand the economic position of those engaged in agriculture and the changes that have taken place in it, therefore, it is necessary to look at the situation as regards the fundamental factors underlying agricultural production—the "plant" and the labor force—and then to examine the exchange relationship between agriculture and other production.

The Development of Our Agricultural "Plant"

During approximately the first hundred years of our history, the land area and therefore the agricultural base of the nation were progressively expanded through additions of new territory. But, by about 1860, the basis of our agricultural resources, and the limits within which further expansion of the basic agricultural "plant" of the country could

take place, had been definitely established, so far as this continent is concerned.

Of the total land area of approximately 1,903 million acres acquired by that time, it is estimated that about 468 millions are arid range suitable only for grazing and with very low carrying capacity; about 328 millions are humid land suitable only for forest and incidental grazing. About 973 million acres are physically capable of use for either crops or pasture, although probably much of this land will be used for forest and much of it could be cultivated only at great cost. This represents the physical limit to which our agricultural "plant" could conceivably be extended.[1]

In 1920 the amount of land in farms, 956 million acres, almost equalled the maximum acreage capable of use for crops; but only 503 million acres of this farm land were improved, and only 350 million acres of this improved land were used for crops. It is evident, therefore, that since 1860 there has been, and still remains, a considerable margin for extension of our agricultural "plant."

Up to that time our agriculture had developed on the basis of a rapidly increasing area of freely or cheaply available virgin land, requiring relatively little original money investment or working capital. Thereafter its expansion has had to take place either by more extensive or more intensive cultivation within a fixed area, that is, by extending the area of improved land and land in crops, or by cultivating the existing crop acreage more intensively, or by both methods. Such development as has taken place in our agricultural "plant" has depended upon the relative economic advantages of improving more land or cultivating more improved land, and those of more intensive cultivation of land already used for crops. This, in turn, has depended upon the complex interrelationship of many factors, among which the following are the most important: changes in population, particularly the urban population; changes in yield per acre; changes in exports and imports and consumption of foods and materials; changes in the capital required, as reflected in the value of land; changes in methods of production and in the productivity of the labor force; changes in

[1] U. S Department of Agriculture, Yearbook, 1923, pp. 431 ff.

other operating costs; and changes in the price of farm products. Considered in relation to these factors, the development of our agricultural "plant," in respect to the amount of land in farms, the amount of land improved, and the amount in crops in past decades, should afford some reflection of the changes in the economic status of agriculture as an industry.

Tables 8, 9, and 10 and Charts 1 to 8 show certain features of the trend in these respects.

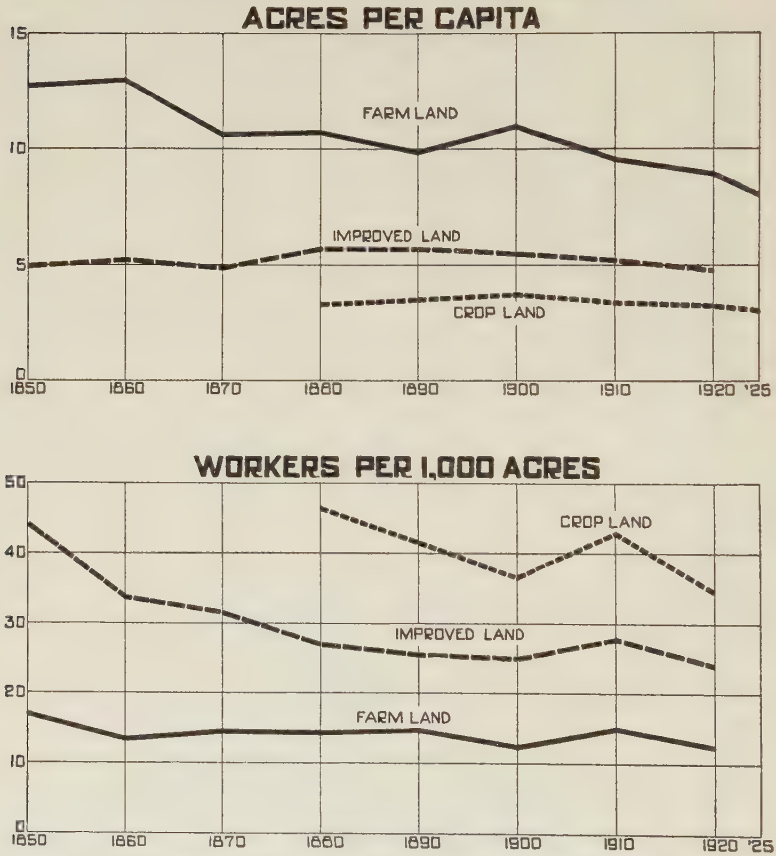
Acreage

Although the acreage of farm land, in actual amount, increased more than that of improved land from 1850 to 1900, and the acreage of improved land increased more than that of crop land, the *rate* of increase of improved land was greater than that of farm land, and that of land in crops was greatest throughout this period. In other words, the proportion of farm land which was improved had been increasing, and that of improved land put into crops had increased even faster. This suggests that even since 1850 there has been a trend toward more intensive utilization of our agricultural resources, although up to 1880 the development was still largely of an extensive character. It has been necessary to improve our farm land faster than we have extended it, and to utilize it for crops faster than we have improved it. Taken by itself, this fact would indicate that it has been necessary for agriculture to work its "plant" more fully rather than to extend it—in short, that the overhead costs of "plant" extension have been relatively increasing. It has been successively less economical to extend the farm acreage, to leave it unimproved, and to leave improved land idle. To put it another way, it would appear that in this period conditions of supply and demand, the labor cost of improvement and operation, and the burden of capital costs were such as to encourage increase of "plant" operations rather than extension of "plant." This trend is obviously largely a reflection of the fact that the better portions of our land area were rapidly being occupied. Even during this half century the limits of profitable "plant" extension were being approached.

About 1900, however, the rate of increase of land in farms, improved land and crop land diminished greatly. The average

percentage of increase per decade in land in crops fell from 30.5% in the period 1880–1900 to 10.9% in the period 1900–1920. The improved farm acreage, which had increased

CHART 1: ACREAGE OF LAND IN FARMS, OF IMPROVED LAND AND OF LAND IN CROPS, IN RELATION TO POPULATION AND AGRICULTURAL WORKING FORCE, 1850–1925



Source: U. S. Department of Agriculture and Bureau of the Census. See Table 8 for details.

30.4% per decade before 1900, or nearly as fast as the crop acreage, increased only 10.2% per decade after 1900. The rate of increase of land in farms up to 1900 was 24.3% per decade, but after 1900 only 6.8%, and from 1920 to 1925,

TABLE 8: THE NATION'S POPULATION, THE AGRICULTURAL "PLANT" AND ITS WORKING FORCE, 1850–1925

Year	Population of the United States[1]	All Land in Farms			Improved Land			Crop Land			Agricultural Working Force			
		Acres	Per Cent. Increase During Decade	Acres per Capita	Acres	Per Cent. Increase During Decade	Acres per Capita	Acres[2]	Per Cent. Increase During Decade	Acres per Capita	Persons Engaged in Agriculture[3]	Persons per 1000 Acres: Farm Land	Persons per 1000 Acres: Improved Land	Persons per 1000 Acres: Crop Land
	(Thousands)	(Thousands)			(Thousands)			(Thousands)			(Thousands)			
1850	23,192	293,561	..	12.7	113,033	..	4.9	..	..	..	5,000	17.0	44.2	..
1860	31,443	407,213	38.7	13.0	163,111	44.3	5.2	..	..	..	5,500	13.5	33.7	..
1870	38,558	407,735	0.1	10.6	188,921	15.8	4.9	..	..	..	5,949	14.6	31.5	..
1880	50,156	536,082	31.5	10.7	284,771	50.7	5.7	166,187	..	3.3	7,714	14.4	27.1	46.4
1890	62,948	623,219	16.3	9.9	357,617	25.6	5.7	219,706	32.2	3.5	9,148	14.7	25.6	41.6
1900	76,129	838,592	34.6	11.0	414,498	15.9	5.5	283,149	28.9	3.7	10,382	12.4	25.0	36.7
1910	92,267	878,798	4.8	9.6	478,452	15.4	5.2	311,195	9.9	3.4	13,278	15.1	27.8	42.7
1920	106,418	955,884	8.8	9.0	503,073	5.1	4.8	348,552	12.0	3.3	12,065	12.6	24.0	34.6
1925	113,494[4]	924,889[4]	[6]	8.1	..	..	..	344,280[5]	[7]	3.0	..	..	..	..

[1] Mid-year estimates by the Bureau of the Census.
[2] Land in harvested crops, reported for year preceding decennial census. Source: Dept. of Agriculture and Bureau of the Census.
[3] Figures for 1850 and 1860 include slaves. Figures for 1910 and 1920 adjusted by Dept. of Agriculture as of June 1.
[4] Estimates by the Bureau of the Census. Figures for farm acreage are preliminary estimates from the farm census of 1925.
[5] Preliminary estimate from farm census of 1925.
[6] Decrease of 3.2% during 5-year period.
[7] Decrease of 1.2% during 5-year period.

judging by preliminary figures, there took place an actual decrease in the farm acreage—the first in our history.

This suggests that after 1900 new conditions of capital, labor and operating costs and of supply and demand arose which not only made it uneconomic to extend the "plant" faster than its operation, *but tended also to reduce to rate of increase of "plant" operation.* Let us look at the most important of these, the conditions of supply and demand as affected by population changes, yield per acre and foreign competition.

Acreage and Population

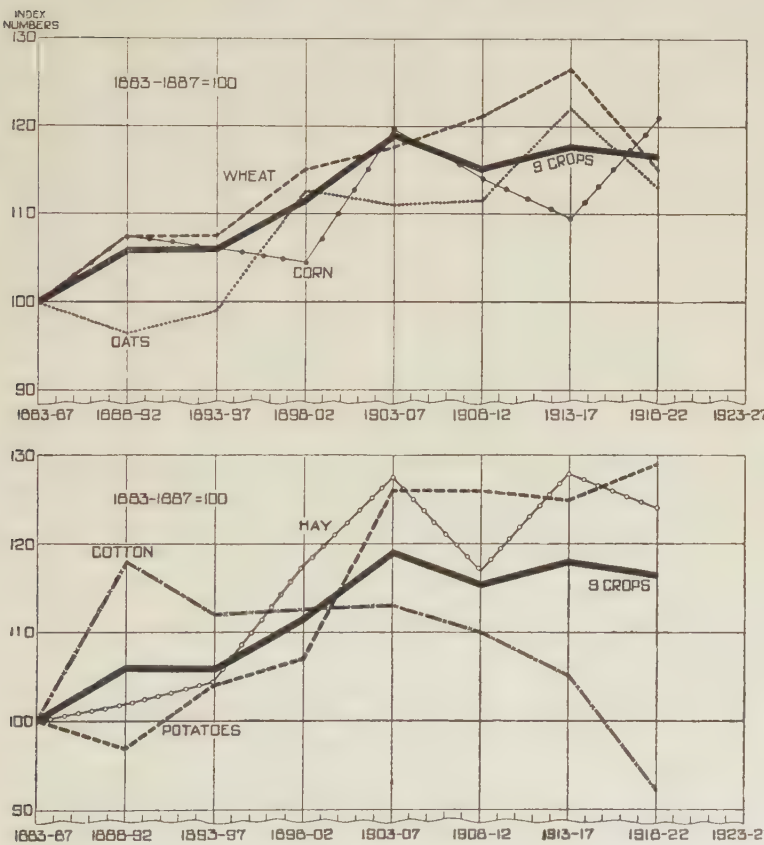
Up to 1860 the land in farms increased faster than the population; but the per capita acreage of land in farms has declined 37.7% since. The improved land within the farm acreage continued to increase faster than the population up to 1880, but the per capita acreage of improved land has steadily declined since by nearly 16%. The land in crops within the improved acreage continued to increase faster than the population up to 1900, but the per capita acreage of crop land declined by about 10% from 1900 to 1920, and on the basis of preliminary estimates for 1925 the decrease to date has been over 16%.

Taken alone, these facts suggest that since 1860 the relation between supply and demand and costs in agriculture has not warranted any increase of farm acreage per capita; since 1880 it has not warranted any extension of improved land relative to the population; and since 1900 it has not warranted even an increase in the acreage of crop land per capita. In other words, up to 1860 conditions were such that it was economically possible to increase the farm acreage faster than the population; up to 1880 it was possible to improve the farm acreage faster than the population grew; and up to 1900 the economic position of the industry made it possible to increase the crop acreage, that is, the operating "plant," faster than the population.

Thereafter population growth not only did not stimulate any relative extension of farm land, or any improvement of farm land, but did not warrant any increase in the number of productive units of "plant" relative to the population. Was

this due to increasing productivity per unit, slackening domestic demand, foreign competition, or increasing costs relative to prices?

CHART 2: CHANGES IN AVERAGE YIELD PER ACRE OF SIX IMPORTANT CROPS AND OF NINE PRINCIPAL CROPS COMBINED, BY FIVE-YEAR PERIODS, 1883–1922



Source: U. S. Department of Agriculture, Yearbook, 1923, p. 464.

Production Per Acre

While the per capita acreage of farm land decreased after 1860, and the per capita acreage of improved land after 1890, the yield per acre of nine principal crops increased

rapidly up to the beginning of the present century along with the per capita acreage in crops. Since then, however, not only has the per capita acreage of crops declined but the yield per acre has shown no tendency to increase since the five-year period 1903–1907, as may be seen from Chart 2.[1]

In short, it appears that up to about 1900 there was an extension both of operating "plant" relative to population and of production per "plant" unit; thereafter the per capita acreage of crop land has declined and the yield per acre has shown no compensating rise. This represents a backward trend in both the extensive and intensive utilization of our agricultural resources. Even in the period of rapidly increasing yield per acre, up to 1900, our yields reflected not any extraordinarily high intensiveness of cultivation, but rather the virgin fertility of the cheap new land brought under cultivation. The yield in most European countries, despite long exploitation of the soil, is higher than in the United States, due to more intensive cultivation.[2] The extension of crop acreage faster than the population and the rising yield per acre up to 1900 reflect an agriculture expanding on the basis of both cheap, fertile land and low labor costs. The decline in both respects after 1900 suggests increasing capital and labor costs and conditions adverse to maintenance of soil fertility. What have these changes meant for the supply of agricultural products in relation to the population?

Production and Population

Up to 1900 the volume of crop production appears to have increased faster than the population. Since about 1900, however, population growth has equalled or exceeded the growth of agricultural production.[3] The increase of demand relative

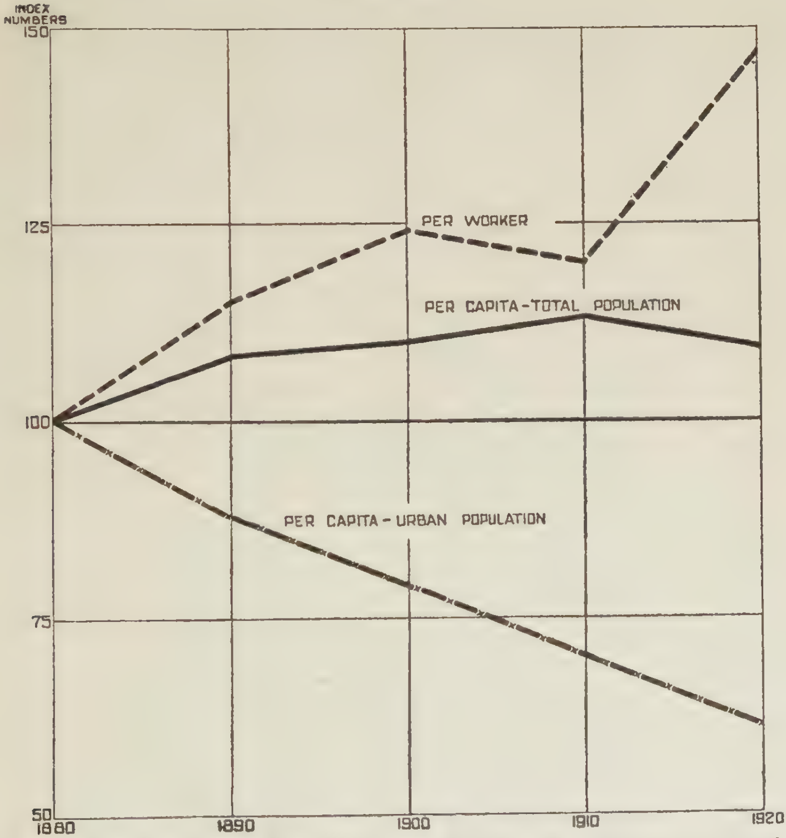
[1] It should be noted that the stationary or declining acre yield indicated in this chart during the past two decades is partly the reflection of circumstantial factors, such as weather conditions, plant diseases and pests. The great decline in the cotton yield due to the boll weevil is largely responsible for the trend shown for the nine crops.

[2] See p. 137.

[3] The estimates of the Harvard Bureau of Economic Research indicate that since 1900 crop production has increased nearly as fast as the total population, while those of the Department of Agriculture indicate a decline of over 7% in the per capita production since 1900. In view of the decline in the per capita crop acreage and in the yield per acre, the latter conclusion is the more probable one. Since the number of livestock per capita has steadily decreased since 1893, it is probable that the downward trend of per capita production would be emphasized if animal products were included.

to production is even more pronounced in respect to the urban population, for the volume of production per capita of urban population has fallen nearly 40% since 1880 and has declined 20% since 1900 alone, while the rural population has increased only 12% since 1900.

Chart 3: Changes in Agricultural Production in Relation to Population and Working Force, 1880–1920
(1880 = 100)



Source: Production index is based on E. E. Day's "Index of the Physical Volume of Production," Harvard Bureau of Economic Research, *Review of Economic Statistics*, 1920. Three-year averages centered at census years are used. Total and urban population indices are based on decennial censuses. The number of workers in agriculture is based on the decennial census data, adjusted for 1910 and 1920 to a June 1 basis to secure comparability with earlier census dates.

TABLE 9: AGRICULTURAL PRODUCTION, POPULATION AND WORKING FORCE, 1880–1920

Census Years	Index of Production[1] (1879–81 average =100)	Index of Total Population (1880 =100)	Index of Urban Population (1880 =100)	Index of Agricultural Working Population (1880 =100)	Index of Agricultural Production per Capita		
					Total Population	Urban Population	Agricultural Working Population
1880	100	100	100	100	100	100	100
1890	136	126	155	119	108	88	115
1900	167	152	212	135	110	79	124
1910	207	183	294	172[2]	113	70	120
1920	230	211	378	156[2]	109	61	147

[1] Based on E. E. Day's "Index of the Physical Volume of Production," Harvard University, *Review of Economic Statistics*, 1920; 3-year averages centered at census years.

[2] Based on census figures adjusted to June 1 basis.

These facts suggest that up to 1900 the position of the industry warranted or stimulated the extension of plant and its production, by extending the per capita acreage of farm land, by improvement of the farm acreage, by extension of crop land and increasing production per acre. The extent of this expansion is indicated by the fact that with an increase of as little as 40 million acres in our present acreage of crop land, together with a moderate increase in yield per acre and some feasible changes in our national dietary, we should be able to feed a population of 150 millions expected in 1950, without difficulty and with some surplus for export.[1]

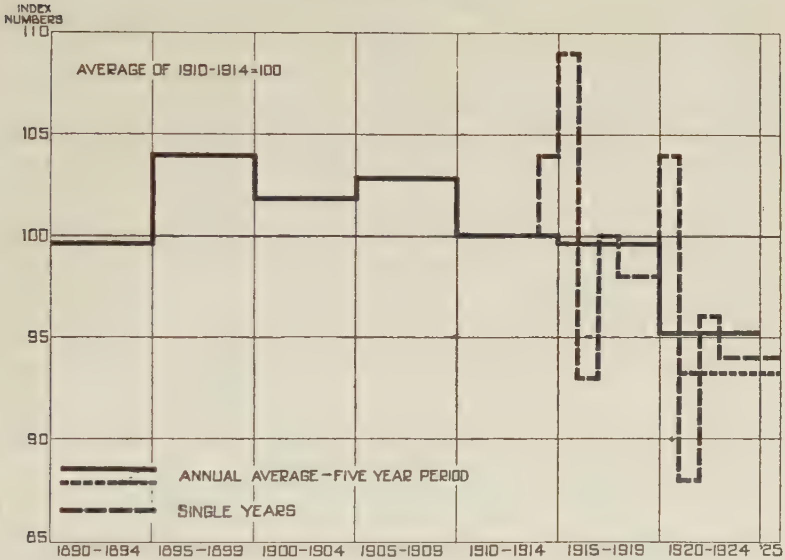
Since the beginning of the century, however, conditions of supply and demand and cost have not been such as to warrant maintaining, through either the extension of "plant" or more intensive operation of the "plant," the same rate of increase of production in the agricultural industry relative to our total population as existed before that time.

These changes in the capacity and output of our agricultural "plant" must obviously reflect changes in the market situation with respect to supply and demand, arising in turn out of changes in capital costs, and in labor and other operating costs, relative to the value of its products.[2]

[1] U. S. Department of Agriculture, Yearbook, 1923, p. 495.

[2] These, of course, are not the only factors. Changing dietary habits, shifts in kinds of production, changes in immigration, the influence of land settlement agencies, and other factors, discussed in Chapters III and IV, have played a part. But in the long run the trend of acreage and production must reflect underlying conditions of cost and price.

CHART 4: CHANGES IN PER CAPITA PRODUCTION OF CROPS, 1890–1925



Source: U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, December, 1925, p. 379.

TABLE 10: PER CAPITA PRODUCTION OF CROPS, 1890–1925[1]

Index numbers, average of 1910–1914 = 100

Period	
1890–94	99.6
1895–99	104
1900–04	101.8
1905–09	102.8
1910–14	100
1914	104
1915	109
1916	93
1917	100
1918	98
1919	98
1920	104
1921	88
1922	96
1923	94
1924	94
1925	94
1915–19	99.6
1920–24	95.2
1921–25	93.2

[1] U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, December, 1925, p. 379.

Exports, Imports and Consumption

The decline in the per capita production since 1900 was accompanied up to the war period by a decline in the per capita exports, as Chart 5 shows, and by an increase in the per capita imports of agricultural products.[1] This trend obviously implies at bottom a weakening competitive position for the agricultural industry in relation to foreign producers, in both the foreign and domestic markets. Although the tariff on farm products may have strengthened the position of the industry in the domestic market with respect to competitive imports, like sugar, wool and flax, dairy products and beef, it has had no influence on alternative food products,[2] and it has had no effect upon competition in foreign markets. Up to 1900 it was possible to expand the capacity and production of the industry more rapidly than the growth of domestic population, because production costs permitted the profitable disposal of a large surplus abroad. Since then we not only have not increased our production as fast as our population, but have failed to maintain our export market and have steadily increased our imports despite a rising tariff. This suggests, although it does not prove, that domestic production costs have tended to rise faster than price levels effective in the domestic market.

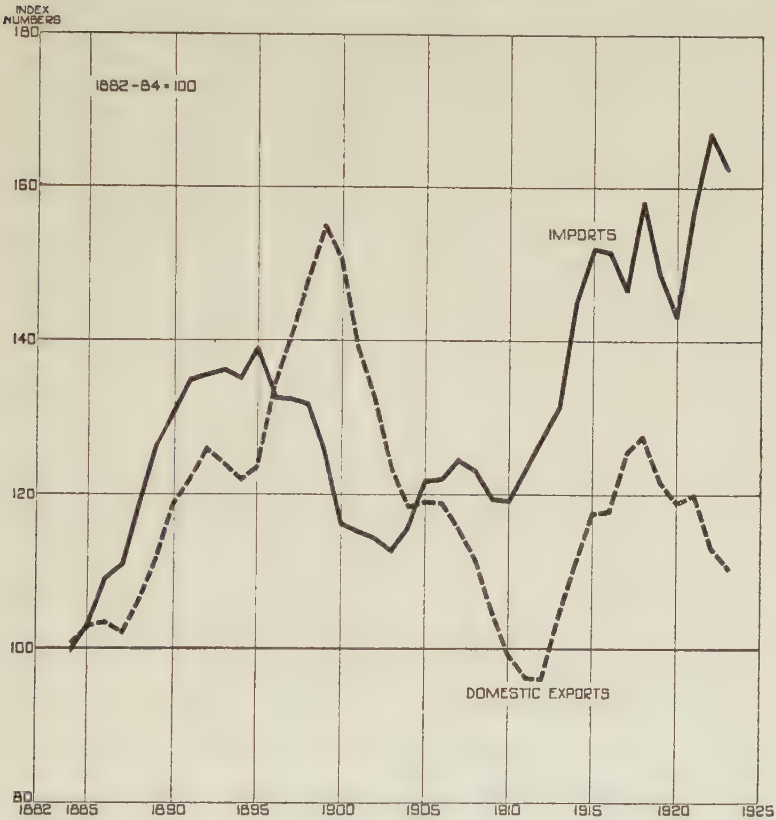
Moreover, in respect to certain products, such as meats, the rise in production costs has resulted not only in a tremendous decline in exports, as Chart 6 shows, but in such a contraction of production that the per capita consumption has tended to decline despite increasing imports. The crop acreage used in feeding livestock has declined 10% since 1917, and the per capita acreage so used has declined about 12% since 1909.[3] The number of livestock has remained practically stationary since 1893, while the number per capita

[1] It is realized that these imports are not all directly competitive, but, excepting a few commodities like rubber, they are either competitive or alternative, i. e., they displace relatively some demand for domestic products. In 1925 the imports of obviously competitive agricultural products were over 50% of the total value of agricultural imports.

[2] Such as tropical fruits and vegetables.

[3] U. S. Department of Agriculture, Yearbook, 1923, p. 448. This is partly due to improved methods of feeding and to the displacement of horses by motor power on farms; but it reflects chiefly the decline in the number of livestock.

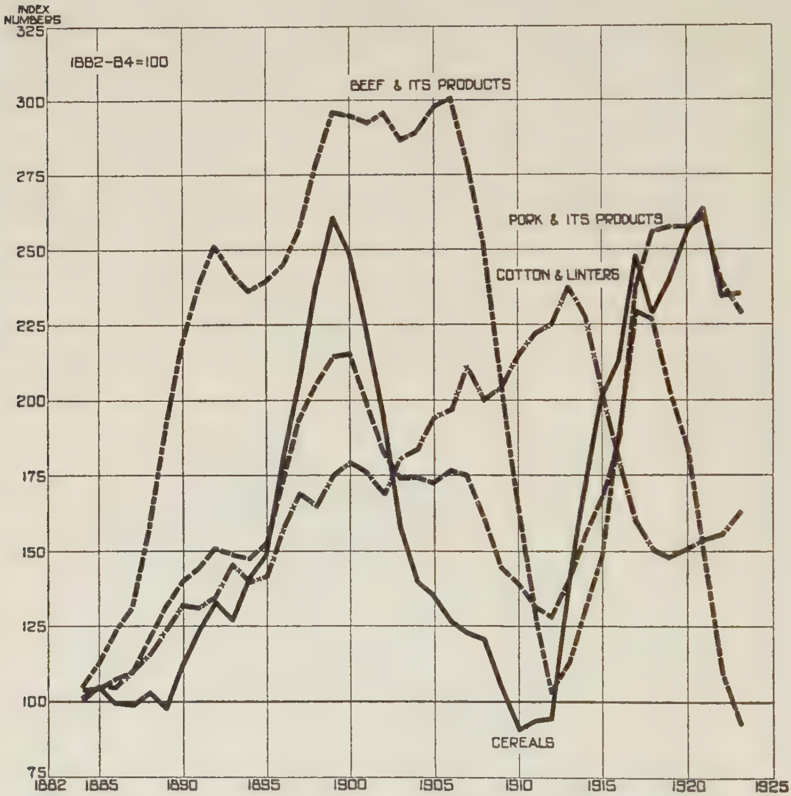
CHART 5: CHANGES IN PER CAPITA VOLUME OF EXPORTS AND IMPORTS OF AGRICULTURAL PRODUCTS, BY FIVE-YEAR MOVING AVERAGES, 1882–1925



Source: Based on values of agricultural exports and imports deflated by index of wholesale prices of agricultural products. Values of exports and imports are for fiscal years, from U. S. Bureau of the Census, "Statistical Abstract of the United States," 1921, p. 840, and 1924, p. 584. Wholesale prices are for the calendar years and are taken from U. S. Bureau of Labor, Bulletins 149, p. 179, and 390, p. 8. Population estimates are for mid-years, from "Statistical Abstract," *op. cit.*

has declined, as Chart 9 shows. Between 1920 and 1925 there was a decline of about 13% in the number of livestock on farms. The per capita consumption of all meats since 1920 has been about 9% less than in 1907–8, as Table 11 shows. This is doubtless partly due to the influence of

CHART 6: CHANGES IN VOLUME OF EXPORTS OF CEREALS, BEEF AND PORK PRODUCTS, AND COTTON, BY FIVE-YEAR MOVING AVERAGES, 1882–1925



Source: Based on U. S. Department of Agriculture, Yearbooks, 1908, p. 779, and 1924, p. 1074. Cereals include flour and meal on a grain basis. Beef and beef products include canned, cured and fresh beef, oleo oil and stock, oleomargarine, tallow and stearin from animal fats. Pork and pork products include canned, fresh or pickled pork, lard, neutral lard, lard oil, bacon and hams. Linters are measured in equivalent 500 lb. bales of cotton.

dietetic ideas, but it is chiefly ascribable to the shift to other foods due to the rise in prices resulting from increased production costs. The production of meat requires a greater acreage of crops per capita than does that of other foods, and in the contraction of the agricultural industry in the face of foreign competition since 1900 it is natural that this

branch of the industry would suffer the greatest relative restriction.

The rising costs which have led to the contraction of crop acreage and production in the face of foreign competition are a reflection of rising capital charges, labor costs and costs of materials used in the business. What, then, have been the changes in the operating position of the industry that have led to this contraction of "plant"?

TABLE 11: PER CAPITA CONSUMPTION OF MEAT, 1907–1924[1]

Year	Beef	Veal	Lamb and Mutton	Pork not Including Lard	Total Meat
	(Pounds)	(Pounds)	(Pounds)	(Pounds)	(Pounds)
1907	79.5	7.1	6.4	78.4	171.4
1908	72.2	6.8	6.2	85.1	170.3
1909	75.9	7.5	6.6	68.3	158.3
1910	71.5	7.4	6.5	60.2	145.6
1911	68.1	7.0	7.8	75.0	157.9
1912	61.4	7.0	8.2	70.6	147.2
1913	60.9	5.0	7.6	72.5	146.0
Average, 1909–1913	67.6	6.8	7.3	69.3	151.0
1914	58.9	4.4	7.5	69.8	140.6
1915	55.6	4.3	6.4	69.6	135.9
1916	56.8	5.3	6.2	72.7	141.0
1917	60.7	6.5	4.6	58.2	130.0
1918	64.9	7.4	4.6	67.3	144.2
1919	57.7	7.7	5.8	68.3	139.5
1920	59.2	7.6	5.5	68.7	141.0
Average, 1914–1920	59.1	6.2	5.8	67.8	138.9
1921	57.5	7.0	5.7	72.5	142.7
1922	61.0	7.3	5.0	75.6	148.9
1923	62.1	7.9	5.2	90.8	166.0
1924	62.6	8.3	5.2	88.8	164.9

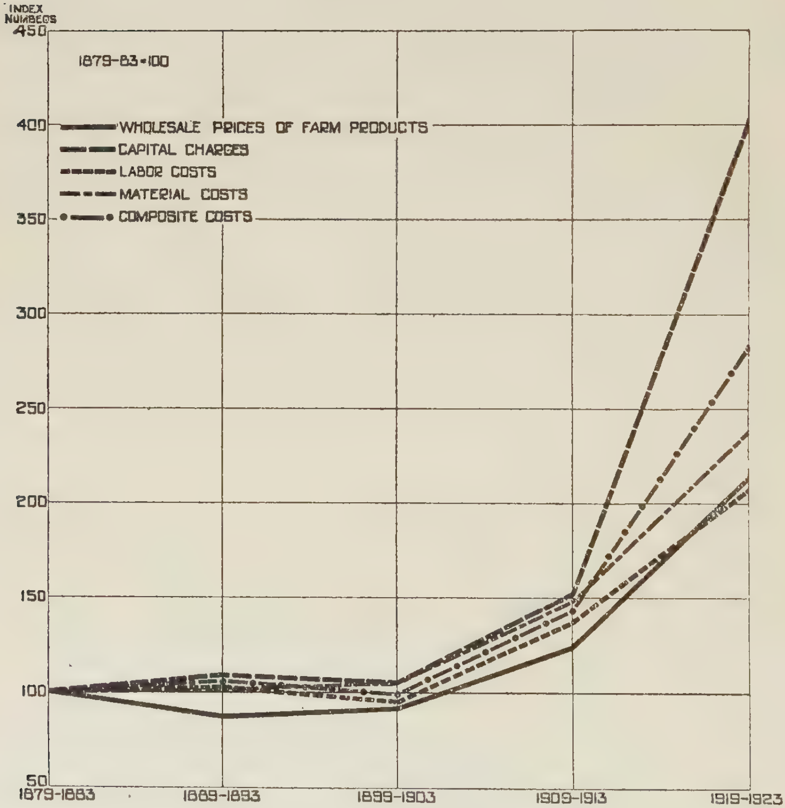
[1] Source: U. S. Department of Agriculture.

Chart 7 is an effort to show the general trend of agricultural costs per unit in relation to prices per unit over the period 1879 to 1923. It is to be regarded only as a general indication, since data are not available which would permit a detailed description such as is given in Tables 15 and 16 for the period 1909 to 1925. But it suggests clearly enough that wide changes that have taken place in the basic factors of the industry's position since the beginning of the century,

and that the current position of agriculture is perhaps not due solely to the effects of the war.

This chart compares the changes in capital, labor and material costs per unit of product with the changes in wholesale prices per unit of product. If, in the period 1879–83, the

CHART 7: TREND OF CAPITAL COSTS, LABOR COSTS, MATERIAL COSTS AND PRICES PER UNIT OF AGRICULTURAL PRODUCTION, 1879–1923



Sources: Capital charges represent total overhead charges for taxes and for interest on total investment relative to the volume of agricultural production. Labor costs represent similarly the cost of all labor, including farm operators, at hired labor rates, relative to the volume of production. Material costs reflect the wholesale cost of non-agricultural commodities used for business and living purposes per unit of product. See Table A, Appendix, p. 155, for details.

wholesale price per unit of product was sufficient to pay for the materials required for the production of each unit, the cost of hired labor per unit, a return for labor at hired labor rates for operators per unit, total taxes per unit and a return for all invested capital per unit at prevailing interest rates, it is clear that the divergence of prices per unit from these costs per unit indicates to what extent the price fails to cover all these charges and implies a sacrifice of labor or investment return per unit for the operator.

Capital Costs

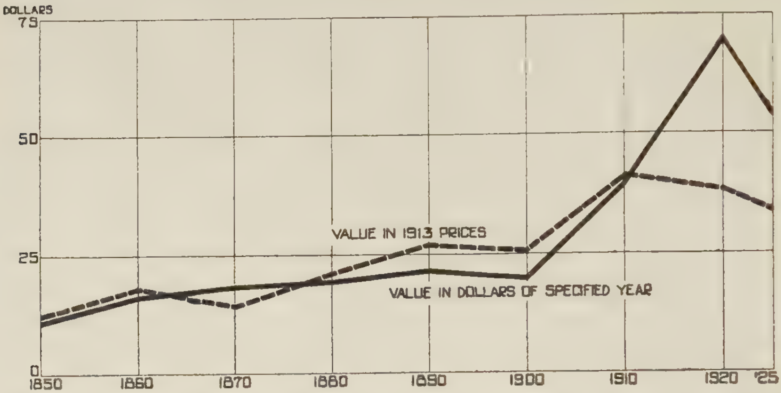
Changes in values of farm property afford a measure of changes in capital costs for the industry. From the point of view of individual farmers, rising farm values imply a prospect of return through turnover of "plant" as among individuals within the industry; but for the industry as a whole, rising land values mean increasing overhead charges on current income for interest and taxes, and so affect the extension of plant and the intensiveness of its operation. Moreover, the burden of these overhead charges, as well as the actual gain from increasing nominal values, depends upon changes in the value of the dollar, increasing as prices fall and declining with a rising price level.[1]

Up to 1860 the per capita acreage of land in farms, as has been seen, increased. Although this was a period of rising prices and declining value of the dollar, investment in the cheap or even free farm land of the West gave promise of speculative return. With a rising price level, little original investment or debt, and low taxes, the capital charges were low. Moreover, on this virgin land the low labor and material costs promised return from production also.

After 1860, however, the value of farm land for the country as a whole increased less rapidly, as Chart 8 shows, while the price level underwent a long decline from 1870 to 1897. Conditions were less favorable for speculative returns for individual farmers from increased land values. Moreover, with the falling price level the burden of capital costs on the industry as a whole tended to rise more than the prices of

[1] See p. 96 and Chapter IV.

Chart 8: Nominal and Real Values of Farm Land and Buildings Per Acre, 1850–1925



Source: U. S. Fourteenth Census, 1920, Vol. V, p. 48, and preliminary figures from the farm census of 1925. Nominal values are deflated by five-year averages of wholesale prices centered on census years, except for 1925, when a single year average is used.

farm products. The rise was slight, however, and other costs, particularly labor costs, tended to remain low.

After 1900, however, land values increased very rapidly, and, up to 1917, faster than the increase in the price level. This implied a rapidly increasing burden of capital costs for the industry as a whole, which was probably intensified by the increasing competition for capital which accompanied the expansion of manufacturing industry and trade after the beginning of the century. It has been seen that after 1900 the number of producing "plant" units per capita—that is, the crop acreage—and the production per unit declined. The burden of capital costs per unit of product must therefore have increased. Chart 7 shows that this indeed did take place.

Capital charges per unit of product, including taxes and interest charges on the total investment, rose slightly from 1880 to 1890, but in 1900 were only 5% higher than at the beginning of the period. They rose nearly 45% between 1900 and 1910 and over 165% between 1910 and 1920. Since wholesale prices of farm products increased only about 130% in the period from 1900 to 1920, it is evident that there must have been a progressive sacrifice of return on the farm opera-

tors' investment in the industry unless material costs per unit of product were reduced or return for the operators' labor was sacrificed.

The question then arises as to whether the increase in capital costs was offset by a decline in other costs per unit of product.

Labor Costs

The enormous reduction in labor costs which took place during the last half of the past century through the invention and application of improved farm machinery—the gang plow, the disk harrow, the corn planter, the reaping, binding and threshing machines, among others—is probably one of the most significant changes in the history of American agriculture. This development has steadily gone forward since, but data are not available by which to determine conclusively whether the reduction in labor costs has been as great since 1900 as it was before.

For the industry as a whole some idea of the trend of labor costs in relation to the "plant" and production is afforded by the fact that number of workers per acre of farm land and improved land declined rapidly from 1850 to 1900, and the number per acre of crop land from 1880 to 1900, while, as has been seen, the yield per acre increased greatly. This is reflected, too, in the fact that the production per person engaged in agriculture rose 24% from 1880 to 1900.

From 1900 to 1910, however, the number of workers per acre of farm land, improved land and crop land rose again, the yield per acre showed no further increase, and the total production per person declined over 3%. The war disturbed this trend and brought about a great increase in production per worker and a further decline in the number of workers per acre, as Chart 3 and Table 9 indicate. But this in itself was offset by higher farm wages, and probably, too, by harder work on the part of the farmer himself, so that it is doubtful if real labor costs declined in this period as much as these figures would suggest.

In other words, after 1900 there appears to have set in a tendency toward stationary or increasing labor costs per unit of product. To the extent that this is true it would be a

natural reflection of the great improvements in labor-saving machinery that had been made before that time. It is also partly a reflection of the increasing competition for labor from manufacturing industry and other fields in which the productivity per worker has shown its greatest increase, or at least a continued increase, since 1900, and in which the rewards have consequently been greater.

Moreover, taking into account not only the amount of labor required per acre and per unit of product, but the cost per unit of labor, these trends are emphasized. From about 1880 to 1899 farm wages increased less than 10%, or 5% per decade, while from the latter year up to the beginning of the war they rose about 50% or nearly ten times as fast as previously. When it is considered that since 1900 the number of workers per acre has tended not to decline as rapidly as before, and the yield per acre has shown no continued increase, while the wage per worker has risen, it is evident that the labor cost per unit has probably risen since the beginning of the century. This is reflected in Chart 7, in which the trend of total labor costs per unit of product, including both hired labor and employers' labor, is shown.

Labor costs, including the value of the farm operators' labor at hired labor rates, declined from 1880 to 1900, rose nearly 45% from 1900 to 1910, and 50% from 1910 to 1920. In the first period, up to 1910, this was due chiefly to the increase in the number of workers in the industry, and in the second decade to higher wage levels, since the number of workers actually declined in this period. The rise in labor costs per unit of product after 1900 was somewhat more than matched by the rise of prices of farm products, so that, if it were not for the increase in other costs, the farmer might have secured the same relative return for his labor in 1920 as he did in earlier periods.

But it has already been seen that, after 1900, capital costs per unit of product rapidly increased. Were these increases offset by a decline in material costs per unit?

Material Costs

Changes in the price level of the goods required by the industry for business purposes and living needs of those

engaged in it are the only available measure of changes in material costs. If it be assumed that since 1880 it has required the same number of units of non-agricultural commodities for the business operation of each acre of improved land, and for the living needs of each worker, then the relation between the change in the production of farm products, the changes in improved acreage and gainfully employed persons, and the change in the price level of non-agricultural commodities, should indicate the trend of operating costs.[1]

On this basis, as shown in Chart 7, it is found that in the period 1880–1900 the material costs per unit rose only very slightly. From 1900 to 1910, however, they rose about 40%, and from 1910 to 1920 nearly 60%. That is, up to 1900 production increased about as fast as material costs, but thereafter rose much more slowly. The material overhead per unit of product, representing the business and living expenses of the industry as they were affected by the price level of non-agricultural commodities, rose more rapidly throughout the whole period of our greatest industrial and commercial development than did the price per unit of farm products. Taken together with the increases in the other factors of cost, this implies chiefly an increasingly unfavorable situation for maintenance and improvement of equipment and soil fertility, as well as for the standard of living of the farm population. Just as, under increasing capital and labor costs, the farmer would be compelled to sacrifice return for his own investment and labor, so under increasing operating costs he would tend to sacrifice his expenditures on depreciation. That this has taken place is reflected in figures given later.[2]

Combining all three elements of cost per unit of product, weighted according to their relative importance in the period 1909–14, it is seen from Chart 7 that total costs per unit of product remained practically unchanged up to 1900, but

[1] This is probably the least satisfactory of the three measures of the trend of costs, because of lack of adequate data on consumption of non-agricultural products by farmers—a difficulty that remains even in connection with current statistics relating to the position of the industry. It is realized in the present comparison that the wholesale prices of non-agricultural commodities do not accurately reflect the cost of commodities bought by farmers, and that the material costs do not vary in simple or constant with the acreage or the number of workers.

[2] See pp. 135–137.

increased over 40% from 1900 to 1910, and nearly 100% from 1910 to 1920.

Prices

From the foregoing it appears that from about 1900 to the beginning of the war, the agricultural industry was faced with a tendency toward a marked increase of costs per unit of product, and this tendency was emphasized during the war period. The question than arises as to whether the price level of farm products rose in relation to these increasing costs. The relationship is shown in Chart 7, from which it appears that while the price level of agricultural products moved in fairly close parallel with unit costs up to 1900, there was an increasing divergence thereafter.

The implication in all these facts is that, for individual farmers with capital invested in the industry, the chief source of improvement in their position after 1900 was the increase in the value of farm property. This improvement was real up to 1917, since the general price level did not rise so fast as the value of farm property, but thereafter, as Chart 8 shows, it was largely illusory, since the real value actually declined between 1910 and 1920 and both the real and actual value from 1920 to 1925. In any case, for the industry as a whole, that is, for those producers who did not turn over their property and realize on the rising values, the increase meant a greater burden of fixed charges to be met out of current income. This meant a sacrifice of return on the operators' investment, or reduction of the value of this equity, or sacrifice of labor reward for the operator, or deferring of maintenance and improvement of equipment and soil resources. That this took place increasingly after 1910 is indicated by the figures for bankruptcy given on page 63, by those for the increase in mortgage debt given on page 121, by the comparison of labor return of farm operators with that for other labor given in Tables 15 and 16, by the changes in agricultural wealth shown in Table 14, and by the trend of the share of agriculture in the national income, next to be examined.

While the foregoing analysis of the long-time trend of acreage, production, working force, unit costs and prices is

not offered as conclusive evidence on the point, it strongly suggests the possibility that the difficulties in which our agriculture has found itself since 1920 have not been wholly the result of the war upheaval, but have reflected in part conditions and forces discernible before the war and probably as early as the beginning of the century. Further study of this question is much to be desired, since it vitally affects the approach to the problem from the standpoint of national policy.

Share of Agriculture in the National Income

Partly because the estimates of income by decades from 1850 to 1920 were made on a somewhat different basis from those for the period from 1909 to 1921, and partly because we are interested chiefly in the change in the position of agriculture that took place after 1900, the two periods are separated in the following presentation.

Table 12A shows the distribution of the working population and of the total national income by decades from 1850 to 1920 inclusive, on the basis of one set of estimates and classifications. Table 12B shows the distribution of the gainfully occupied and of the national income from 1909 to 1921, inclusive, on the basis of somewhat different methods of classification and estimation. Both these tables show the familiar fact of the decline in the proportion of our working population engaged in agriculture and of its share in the national income. This is, of course, a reflection of the development of industry, trade, finance and governmental services, all of which present practically an unlimited scope for expansion, while agriculture is necessarily limited in this respect not only because it is based upon limited natural resources, but because it has to reckon with a relatively inelastic demand for its products.

The significance of these changes, however, is not apparent until the change in the proportion of the working population engaged in agriculture is related to the change in proportion of the national income ascribed to it. An attempt has been made in Tables 13A and 13B to show the change in the relative position of persons engaged in agriculture through these two periods. This is done by calculating the amount

TABLE 12A: DISTRIBUTION OF GAINFULLY OCCUPIED AND SHARES IN NATIONAL INCOME, MAJOR ECONOMIC GROUPS, 1850–1920[1]

	Agriculture[3]	Manufacturing[4]	Mining[5]	Transportation[6]	Miscellaneous[7]
WORKING POPULATION[2] (%)					
1850	63.2	15.3	1.04	2.24	18.3
1860	53.0	18.4	1.52	2.61	24.5
1870	47.6	20.1	1.32	3.22	27.8
1880	44.4	20.3	1.43	3.36	30.5
1890	39.2	22.7	1.66	4.83	31.6
1900	35.7	22.5	1.94	5.20	34.7
1910	34.8	27.8	2.53	6.91	28.0
1920	29.0	30.8	2.62	7.37	30.2
SHARE OF INCOME (%)					
1850	34.6	19.6	1.04	18.6	26.2
1860	29.9	22.0	1.71	19.8	26.6
1870	26.5	23.9	2.16	11.1	36.3
1880	20.0	24.4	2.95	12.5	40.2
1890	18.7	31.6	2.73	9.91	37.1
1900	20.5	28.5	3.30	8.82	38.9
1910	18.0	29.2	3.04	9.53	40.3
1920	13.8	27.5	3.68	9.67	45.3

[1] Based on W. I. King, "The Wealth and Income of the People of the United States," New York, 1917; National Bureau of Economic Research, "Income in the United States," New York, 1921; and National Bureau of Economic Research, "Income in the Various States," New York, 1925.

[2] Based on census classifications.

[3] Income figures include forestry and animal husbandry, except in 1920, when lumbering is included under manufacturing. Occupational figures for 1850 and 1860 include an estimate of the number of slaves; figures for 1910 and 1920 have been adjusted to June 1 to make them comparable with figures from previous censuses, according to data from the U. S. Department of Agriculture.

[4] From 1850 to 1900, inclusive, income figures include light and power plants; and in 1910 and 1920 construction is included.

[5] Income figures include quarrying and oil production.

[6] Income figures include steam and electric railroads and water transportation, but not motor truck haulage, separate figures for which are not available. In 1910 and 1920 light and power plants and telephone and telegraph companies are included.

[7] Income figures include banking, mercantile and professional services, and governmental services, i. e., total taxation.

received by each person engaged in agriculture and in each major branch of industry for each hundred dollars received by persons engaged in all other occupations combined, and the amount received by persons engaged in agriculture for each hundred dollars received by persons engaged in specific major occupations. The figures given should not be regarded as absolute amounts or as representing actual earnings. They

TABLE 12B: DISTRIBUTION OF GAINFULLY OCCUPIED AND SHARES IN NATIONAL INCOME, MAJOR ECONOMIC GROUPS, 1909–1921[1]

	Agriculture[3]	Manufacturing[4]	Mining[5]	Transportation[6]	Miscellaneous[7]
	WORKING POPULATION[2] (%)				
1909	25.67	28.79	3.27	7.46	34.81
1910	25.08	28.27	3.27	7.58	35.80
1911	24.63	28.18	3.27	7.70	36.22
1912	24.19	28.24	3.26	7.71	36.60
1913	23.70	28.18	3.21	7.64	37.27
1914	23.63	28.55	3.20	7.67	36.95
1915	23.45	28.78	3.18	7.66	36.93
1916	23.09	29.77	3.10	7.61	36.43
1917	22.54	30.52	3.02	7.66	36.26
1918	21.41	30.10	2.84	7.79	37.86
1919	22.06	31.43	2.97	8.12	35.42
1920	22.17	31.27	3.09	8.78	34.69
1921	21.70	28.89	3.06	8.63	37.72
	SHARE OF INCOME (%)				
1909	16.29	28.04	3.14	9.60	42.93
1910	18.03	26.96	3.04	9.53	42.44
1911	17.21	25.92	3.18	9.84	43.85
1912	15.76	27.06	3.30	9.68	44.20
1913	16.54	27.11	3.35	9.38	43.62
1914	17.80	24.68	3.06	9.34	45.12
1915	17.66	25.73	3.14	9.50	43.97
1916	15.96	30.94	3.39	8.86	40.85
1917	18.05	30.12	3.44	8.42	39.97
1918	21.01	28.65	3.33	8.67	38.34
1919	18.33	26.82	3.18	8.58	43.09
1920	13.84	29.78	3.68	9.67	43.03
1921	10.56	24.07	3.04	9.78	52.55

[1] Based on National Bureau of Economic Research, "Income in the United States," Vol. II, New York, 1921, and "Income in the Various States," New York, 1925.

[2] The occupational classification here used is not comparable with that in Table 12A, chiefly because the figures for agriculture and certain other specific industries include only adult male workers. See "Income in the United States," *op. cit.*, pp. 31 ff.

[3] Income figures include animal husbandry.

[4] Income figures include hand trades, laundries, construction, gas manufacture and lumbering.

[5] Income figures include quarrying and oil production.

[6] Income figures include commercial light and power plants, steam railways, Pullman, express switching and terminal companies, water transportation, street railways, telephone and telegraph companies.

[7] Income figures include banking, mercantile and professional services, and governmental activities, i. e., total taxation.

Table 13A: Relative Per Capita Shares in National Income of Persons Engaged in Agriculture and Other Occupations, 1850–1920[1]

(Share of Each Person Engaged in Other Occupations =100)

	Agriculture Relative to					Manufacturing Relative to All Other	Mining Relative to All Other	Transportation Relative to All Other	Miscellaneous Relative to All Other
	All Other	Manufacturing	Mining	Transportation	Miscellaneous				
1850	31	43	55	7	38	135	104	998	158
1860	38	47	50	7	52	125	113	920	112
1870	40	47	34	16	43	125	165	375	148
1880	31	37	22	12	34	127	209	411	153
1890	36	34	30	23	41	157	166	217	128
1900	46	45	34	34	51	137	173	176	120
1910	41	49	43	38	36	107	121	142	174
1920	39	53	34	36	32	85	142	135	191

[1] These figures are derived from Table 12A by relating the percentage of the total gainfully occupied in each group to the percentage of the national income ascribed to each group, for each period. In this way the influence of changes in general price levels is eliminated, although the distributions probably reflect in some measure changes in price levels of manufactures, mining and agricultural products relative to each other and to the general price level.

Table 13B: Relative Per Capita Shares in National Income of Persons Engaged in Agriculture and Other Occupations, 1909–1921[1]

(Share of Each Person Engaged in Other Occupations = 100)

	Agriculture Relative to					Manufacturing Relative to All Other	Mining Relative to All Other	Transportation Relative to All Other	Miscellaneous Relative to All Other
	All Other	Manufacturing	Mining	Transportation	Miscellaneous				
1909	56	65	66	49	51	96	96	132	141
1910	66	75	77	57	61	94	93	128	132
1911	64	76	72	55	58	89	97	131	138
1912	59	68	64	52	54	94	101	128	137
1913	64	73	67	57	60	95	105	125	130
1914	70	87	79	62	62	82	95	124	140
1915	70	84	76	61	63	86	99	127	134
1916	63	67	63	59	62	106	110	118	121
1917	76	81	70	73	73	98	114	111	117
1918	98	103	84	88	97	93	118	112	102
1919	79	97	78	79	68	80	107	106	138
1920	56	66	52	57	50	93	120	111	142
1921	43	58	49	43	35	78	99	115	183

[1] These ratios are derived from Table 12B, as described in footnote to Table 13A

indicate only the *relative per capita* share of each group in the total national production in each period.

Table 13A indicates, in general, that up to 1900 the share of national income per person engaged in agriculture increased relative to the share of persons engaged in all other gainful occupations, but from 1900 to 1920 there was a rapid decline in the relative share of agricultural workers, which brought it below the level of 1870. In all decades, the relative share of agriculture has been far lower than that of any other major branch; but its relative position appears to have improved steadily up to 1900, except for the period from 1870 to 1880. The trend of the relative per capita share of agriculture from 1880 to 1920 tends to strengthen the suggestion contained in the preceding discussion in this chapter, namely, that 1900 in some significant way marks a turning point in the position of the industry.

Significant is the fact that the position of agriculture relative to other specific occupations shows wide differences from the general trend. Its position relative to manufacturing has improved since 1890; relative to mining since 1880; relative to transportation in enormous degree since the beginning; and relative to trade, banking and governmental services—the miscellaneous group—up to 1900, but declining thereafter. These facts, together with the decline in the shares of manufacturing, mining and transportation relative to all other groups in each case, and the rise in the relative share of the "miscellaneous" group from 1900 to 1920, suggest that the decline in the relative position of agriculture since 1900 has been in some way connected with the rapid growth of our distributive and banking system and of taxation rather than with changes in our productive industries or transportation system.

The War and Post-War Period

Although the war brought about great changes in specific branches of the industry, which created difficulties in the post-war period, during and after the war there were no marked changes in the general trends of acreage and production noted after 1900 for the industry as a whole, as is indicated in Charts 1, 2, 3, 4, and 9.

Acreage, Production and Exports

The per capita land in farms indeed declined about 6% from 1910 to 1920;[1] the per capita acreage of improved land about 7%, and that of land in crops about 3%.[2]

The yield per acre of nine principal crops rose slightly from 1908 to 1917, but declined thereafter. During the period from 1913 to 1922 potatoes and corn are the only crops that showed an increase in yield per acre, while there was a decline of over 10% in wheat, nearly 10% in oats, nearly 4% in hay and of about 12% in cotton.[3]

The per capita wheat acreage in 1915 was about 25% above the average pre-war level, and rose slightly higher in 1919, but, taking the war period as a whole, the per capita production changed little. In respect to corn, the per capita acreage and production declined throughout the period, while those of cotton fell even more, as Chart 9 shows. The number of livestock per capita, which has been declining since 1893, continued to decline during the war period.[4]

As a result of these conditions the per capita production of farm products showed no increase in the period 1915–19 over the pre-war period.[5] There was, in short, no general expansion in the total agricultural production in relation to our population growth during the war period, and there has been a considerable decline since.

There did take place an enormous rise in exports of cereals and meat products from 1910 to 1920. These "surpluses" were largely the result of changes in the wheat acreage at the expense of other crop or pasture land, together with a falling off of domestic consumption of meats. Exports of cotton, however, declined during the war period. In general the level of agricultural exports was somewhat higher from 1912

[1] Preliminary figures from the farm census of 1925 show a further decline of about 3.2% from 1920 to 1925 in the number of acres in farms—the first actual decline in our history. The per capita acreage in farms decreased 10%.

[2] The decline from 1920 to 1925, on the basis of preliminary figures, was 9%.

[3] Here again it should be noted that these changes in yield were partly a reflection of circumstantial factors, such as weather conditions, plant pests and diseases. The important point is that economic conditions during the war period did not lead to any general increase in yields, but rather made for less intensive "plant" operation and continued increases in unit costs.

[4] Preliminary figures from the Census of Agriculture of 1925 show a decline of about 9 million or 13% in the number of livestock on farms from 1920 to 1925.

[5] See Table 10 and Chart 4.

to 1922 than in the period from 1902 to 1911, but not so high as it had been before 1900. This was, of course, a reflection not of any improvement in the competitive position of the industry, but of the disruption of foreign production and the financing of foreign purchases on credit. Without both of these conditions, it is probable that the downward trend of exports after 1900 would have continued, as indeed that of the per capita total acreage and production did. The outstanding feature of the war period was the expansion of wheat acreage at the expense of other crops in response to artificial conditions of demand and price.

We have, then, in years since 1910 no convincing evidence, from the trend of expansion of "plant" and production, that any fundamental changes had taken place in the tendencies that set in about 1900. In fact Chart 7 shows that the war period up to 1923 rather emphasized these tendencies in a marked degree. The spectacular rise in price levels up to 1920 obscured but did not alter the discrepancy between income and costs in evidence from 1900 to 1910. During part of this period, up to about 1917 or 1918, it is probable that prices per unit of farm products increased somewhat more rapidly than certain elements of cost, as Chart 13 indicates; but, taking the period as a whole, costs rose more rapidly than they had in the period 1900–1910, and more rapidly than agricultural prices.

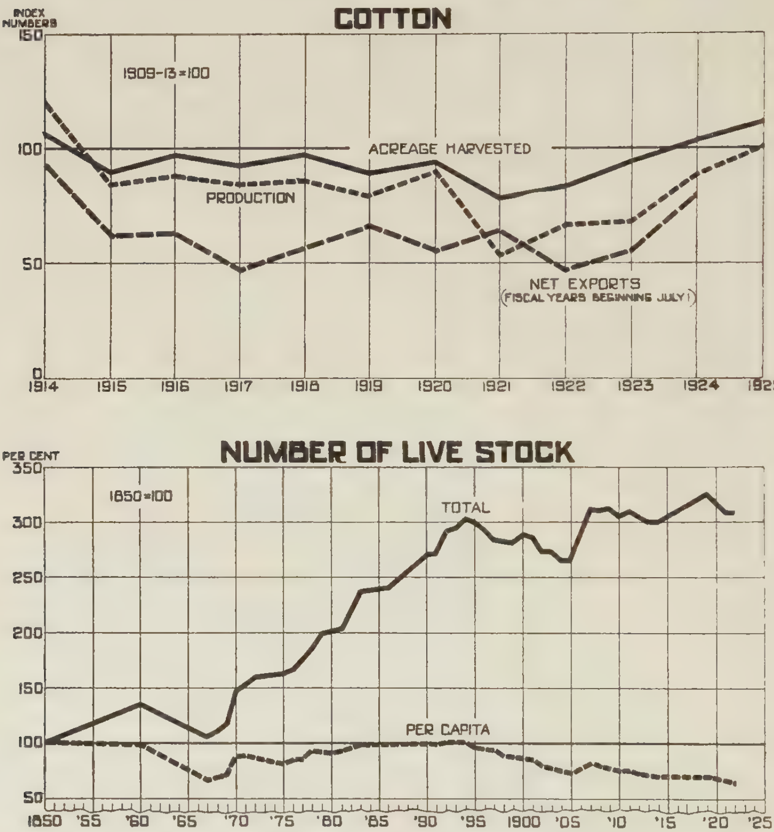
Agricultural Income and Wealth

That the agricultural industry as a whole did not enjoy any permanent improvement during the war period is evidenced by the trend of the relative share in the national income from 1909 to 1921, as shown in Table 13B, covering the war period year by year, but based on data which are not continuous with those used in Table 13A. It shows that while there was considerable improvement in the relative position of agriculture during certain war years, so that in 1918 the relative per capita share of farm workers nearly reached "par,"[1] 1920 and 1921 again showed a recession

[1] The fact that the occupational figures for agriculture used in Table 13B include only adult male workers tends to raise the relative per capita share of agriculture as compared with Table 13A.

5

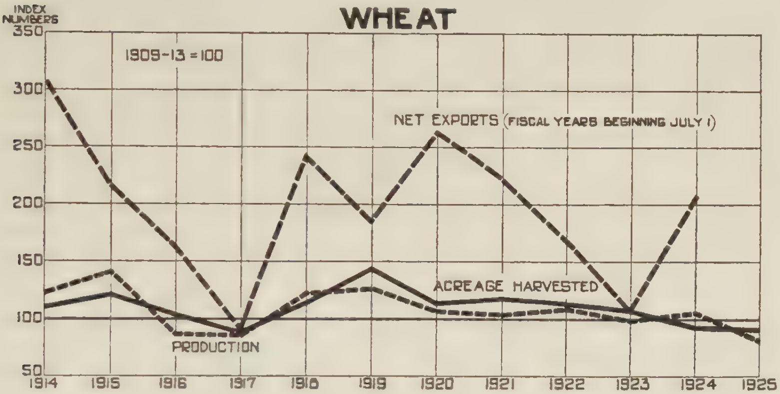
Chart 9: Changes in Per Capita Acreage, Production and Net Exports of Wheat, Corn and Cotton, 1914–1925, and in Number of Livestock, 1850–1922

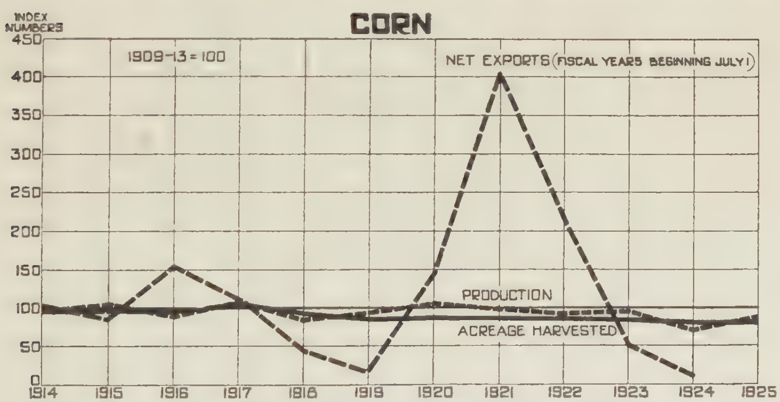


below pre-war levels. On the whole, the relative position of agriculture remained the same as in the earlier period. In this table, too, the increase in the relative share of trade, finance and government in the national income, as compared with that of the productive industries, is further emphasized.

The Census estimates of changes in wealth during the war period compared with earlier periods, as shown in

CHART 9: CHANGES IN PER CAPITA ACREAGE, PRODUCTION AND NET EXPORTS OF WHEAT, CORN AND COTTON, 1914–1925, AND IN NUMBER OF LIVESTOCK, 1850–1922 —(*Continued*)





Source: Chart of Number of Livestock is from U. S. Department of Agriculture, Yearbook, 1924, p. 439. Data on wheat, corn and cotton are from U. S. Department of Agriculture, Yearbook, 1924, and *Crops and Markets*, Monthly Supplement, December, 1925. Population data are mid-year estimates from U. S. Bureau of the Census, "Statistical Abstract of the United States," 1925.

Table 14, indicate also that agriculture on the whole did not show any extraordinary improvement in its position. Indeed, agriculture in this respect presents no exception to

Table 14: Changes in Agricultural and Total National Wealth, 1880–1925

	1880	1890	1900	1904	1910	1912	1920	1922	1924–25
Total national wealth[1] (millions)	$43,642	$65,037	$88,517	$107,104	..	$186,300	..	$320,804	..
Value in 1913 dollars[2] (millions)	$47,853	$80,892	$113,921	$124,395	..	$189,715	..	$194,309	..
Increase %	..	69.0	40.8	9.2	..	52.5	..	2.4	..
Average annual increase %	..	6.9	4.1	2.3	..	6.6	..	0.2	..
Total agricultural wealth (millions)	$12,181[1]	$16,082[1]	$20,440[1]	..	$40,991[1]	$42,492[3]	$77,924[1]	$61,430[4]	$58,568[4]
Value in 1913 dollars[2] (millions)	$13,356	$20,002	$26,306	..	$42,695	$43,271	$42,235	$37,205	$37,979
Increase %	..	49.8	31.5	..	62.3	1.3	−2.4	−11.9	2.1
Average annual increase %	..	5.0	3.2	..	6.2	0.67	−0.3	− 6.0	0.84

[1] Bureau of the Census.

[2] Based on five-year averages of wholesale prices, centered on each year given, except for 1924–25.

[3] National Bureau of Economic Research, "Income in the United States," Vol. II, p. 63, excluding 1% allowance for working capital.

[4] U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, July, 1925, average for crop years, excluding 1% allowance for working capital.

the general fact that the increase in wealth during the war period, for the country as a whole, was largely illusory.[1]

As for agriculture, the real value of farm land and buildings actually decreased by about 18% from 1910 to 1925, as is indicated in Chart 8. While the value of farm implements and machinery, agricultural products and livestock increased in actual dollars on the average 10.87% per year between 1904 and 1912; between 1912 and 1922 the average annual increase was only about eight-tenths of one per cent.[2] In real values, that is, in dollars of constant purchasing power, agricultural wealth, in farm implements, agricultural products and livestock increased about 7% annually from 1904 to 1912; but from 1912 to 1922 it decreased 3.1% annually.[3] Table 14 shows the annual changes in the nominal and real value of *all* farm property by periods from 1880 to 1925 as compared with the total national wealth. It indicates that in nearly all periods since 1880 agricultural wealth has increased less rapidly than the total national wealth. The increase from 1880 to 1890 was 5.0% annually; from 1890 to 1900, 3.2% annually; and from 1900 to 1910, 6.2%. But in the period 1912 to 1920 real agricultural wealth *decreased* on the average 0.3% annually, from 1920 to 1922, 6% annually, and only since 1922 has there been any indication of a rise in real agricultural values.

Return for Capital and Labor

For the period from 1909 to 1925 data are available which enable us to study in some detail certain of the factors which have caused these changes, and their effects, and to compare the actual position of farmers as workers and investors with that of other groups. Chart 7 presented in the most general terms a comparison of the trend of prices and costs per unit of farm products over a long period. Tables 15 and 16 show the approximate actual amounts of agricultural income and of the items of cost from 1909 to 1925 on the basis of figures assembled from several sources. Since the data are not on the same basis throughout, the estimates for the periods

[1] See National City Bank, Bulletin, February, 1926.

[2] National City Bank, *op. cit.*

[3] *Idem.*

Table 15: Return for Investment and Labor in Agriculture, 1909–1920[1]

Period (Calendar Years)	1 Total Value of Farm Property (Millions)	2 Gross Income, Including Food, Fuel and Rent (Millions)	3 Total Taxes on Farm Property (Millions)	4 Total Wages and Salaries Paid to Employees (Millions)	5 Value of Farmers' and Family Labor (Millions)	6 Business Expenses (Millions)	7 Total Return for Property (Millions)
1909	$40,059	$5,647	$225	$717	$2,542	$319	$1,844
1910	41,400	6,757	240	716	2,561	384	2,856
1911	42,225	6,418	260	756	2,686	404	2,312
1912	42,917	6,338	285	761	2,766	405	2,121
1913	45,227	6,985	315	786	2,840	449	2,595
1914	46,619	7,157	350	767	2,804	467	2,769
1915	48,199	7,473	400	786	2,833	446	3,008
1916	52,687	8,461	450	848	3,088	551	3,524
1917	57,110	11,190	500	1,059	3,808	785	5,038
1918	64,122	14,463	550	1,251	4,600	1,031	7,031
1919	71,848	16,947	621	1,500	5,314	1,276	8,236
1920	78,707	12,186	750	1,742	6,131	1,300	2,263

Period (Calendar Years)	8 Per Cent Return on Total Investment	9 Interest Allowance on Total Investment (Millions)	10 Total Return for All Operators' Labor and Management (Millions)	11 Number of Farmers (Thousands)	12 Return per Farmer for Labor and Management	13 Wages of Hired Labor Without Board	14 Annual Earnings of Workers in Other Occupations
1909	4.60	$2,003	$2,383	6,330	$376	$329	$598
1910	6.90	2,070	3,347	6,362	526	330	635
1911	5.48	2,111	2,887	6,376	453	345	631
1912	4.94	2.146	2,741	6,388	429	355	647
1913	5.74	2,261	3,174	6,400	496	364	726
1914	5.94	2,331	3,242	6,410	506	359	691
1915	6.24	2,410	3,431	6,418	535	362	691
1916	6.69	2,634	3,978	6,425	619	394	767
1917	8.82	2,855	5,991	6,432	931	485	879
1918	10.97	3,206	8,425	6,438	1,309	586	1,123
1919	11.46	3,951	9,599	6,443	1,490	675	1,285
1920	2.88	5,116	3,278	6,448	508	779	1,503

[1] For sources of data and method of calculation, see p. 152.

TABLE 16: RETURN FOR INVESTMENT AND LABOR IN AGRICULTURE, 1919–1925[1]

Period (Crop Years)	1 Total Value of Farm Property	2 Value of Farm Operators' Net Investment	3 Gross Income, Including Food, Fuel and Rent	4 Total Taxes Paid on all Farm Property	5 Taxes Paid on Operator-owned Property	6 Total Wages Paid to Hired Labor	7 Value of Farmers' and Family Labor	8 Interest on Operator's Indebtedness	Rent on Property Rented from Non-operators	10 Business Expenses
	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)
1919–20	$79,607	$47,223	$16,621	$596	$388	$1,492	$5,314	$788	$1,712	$3,158
1920–21	72,915	41,126	13,750	806	545	1,732	6,131	896	1,386	3,467
1921–22	62,740	34,153	10,313	848	582	1,088	4,089	836	929	2,280
1922–23	61,349	33,755	11,449	834	617	1,061	3,945	807	975	2,388
1923–24	59,548	32,720	12,453	892	617	1,204	4,428	776	994	2,772
1924–25	59,154	32,516	13,324	891	617	1,206	4,473	753	1,056	2,854

Period (Crop Years)	11 Total Return for Property	12 Per Cent Return on Total Investment	13 Per Cent Return on Operator-owners' Investment	14 Return for all Operators' Labor and Management	15 Number of Farmers	16 Return per Farmer for Labor and Management	17 Return per Operator-owner for Labor and Management	18 Return per Tenant Farmer for Labor and Management	19 Wages of Hired Labor, Without Board	20 Annual Earnings of Workers in Other Occupations
	(Millions)			(Millions)	(Thousands)					
1919–20	$6,061	7.61	5.24	$6,997	6,445	$1,086	$793	$1,326	$675	$1,394
1920–21	1,614	2.21	—0.65	3,735	6,430	581	298	899	779	1,437
1921–22	2,008	3.20	0.32	2,646	6,415	412	178	793	520	1,356
1922–23	3,221	5.25	2.41	3,792	6,400	593	345	945	501	1,374
1923–24	3,157	5.30	2.56	4,310	6,386	675	442	1,016	563	1,411
1924–25	3,900	6.59	3.98	5,120	6,372	804	573	1,122	569	1,415

[1]For sources of data and method of calculation, see p. 153.

1909–1920 and from 1919–20 to 1924–25 are given separately. The resulting estimates of return on capital investment and upon labor differ in many respects from those that have been published heretofore, partly because allowance has been made for the rental value of farm homes as an item in actual agricultural income, and partly because certain obvious errors in earlier treatment of the data have been eliminated as far as possible. The figures, as in all statistical estimates of this kind, must be taken as only a general approximation to average conditions, and they involve a large margin of error; but they may fairly be regarded as representative of the general trend of returns in agriculture and of the comparative position of the farmer as a worker and investor.

Tables 15 and 16 show that, while the return on the total investment in agriculture, after allowing a labor reward for operators at hired labor rates, rose considerably during the years 1917–1919, the average during the five years from 1920 to 1925 (4.6%) was considerably lower than in the five pre-war years (5.8%), and at no period has the total return been high in comparison with that in other industries. Since a considerable part of this gross return represents interest on mortgage indebtedness held by non-farmers at fixed rates higher than these percentages, it is evident that throughout this period the return to farm operators on their investment has been lower than the total return. This is reflected in the figures for the period 1919–1925 in Table 16, showing that the average return on the farm owner-operators' investment, after allowing a nominal wage to the farmer, in 1920–21 was negative, and that the average for the five-year period 1920–25 was about 1.7%. All these estimates of return on capital include the value of the food, fuel and house rent supplied by the farm, which makes them somewhat higher than other similar figures published heretofore.[1]

Assuming, however, a return on the total capital investment throughout this period, varying between 5% in 1909 and 6½% in 1919, it is seen that the return for the farmer's

[1] Since the allowance for the value of house rent used in these calculations is based on estimates covering about 3,000 farm families whose status was probably somewhat better than the average, it is probable that the figures of return here given are considerably higher than would be obtained if the general average value of farm house rentals could be estimated more accurately.

labor and management in the pre-war period 1909–14 averaged about $456 per year, including the value of food, fuel and shelter supplied by the farm. This labor return even in those years was below the average of the annual labor earnings of workers in other occupations by over $200. In 1917, 1918 and 1919 the labor return rose somewhat higher than the annual earnings of other workers, but in the five years from 1920 to 1925 it averaged only $613 as compared with an average of $1,400 for other workers. Taking into account the changes in the purchasing power of the dollar spent by farmers and other workers for living requirements, it is seen from Chart 10 that the "real" annual labor earnings of farmers in 1924–25 were 3% below the level of 1914, while those of other workers had risen 22%.

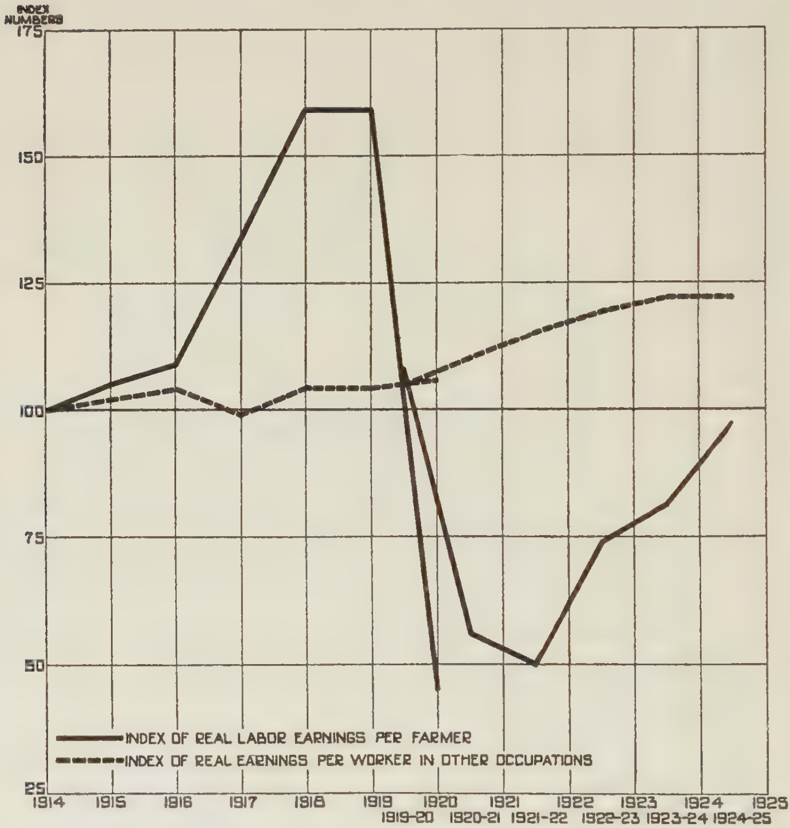
In 1924–25, the most favorable year since 1920, the labor earnings of the average farm operator, including tenants with owners, were $804. This includes the value of food, fuel and shelter supplied by the farm, estimated by the Department of Agriculture at $634,[1] leaving a cash labor return of approximately $170 available for other living expenses.

The owner farmer appears to have been in a less favorable situation than the average. His labor return was $573, or less than the value of the food, fuel and rent enjoyed by the average farmer, a little more than the wages paid to hired labor without board, and less than half the average labor earnings of workers in other occupations. If to this labor return be added the return at 5½% assumed on his investment, averaging $467 per owner-operator, the total return for labor and management is $1,040, of which $634 represents the value of food, fuel and rent supplied by the farm and $406 the total cash income—less than half the amount estimated by the Department of Agriculture as the average cost of the food, clothing, fuel and light, and sundries purchased

[1] Report of the Secretary, 1925, p. 34, summarizing the results of several separate investigations of living standards among farm families in scattered sections of the country. Although both owner and tenant families are included, and it is stated that the figures were found to vary little from locality to locality, it is probable that they represent conditions among a special group rather than the average, and are therefore somewhat too high. This suggestion is supported by the fact that the Department estimates the average value of food used on farms in 1924–25 at $366 per farm, and reports $266 as the value of food used per farm by some 15,000 owner-operators studied. (*Crops and Markets*, *op. cit.*, July, 1925, p. 237.)

by 3,000 owner and tenant farmer families in widely scattered sections.[1] The tenant-operator, according to these figures, would seem to be in a somewhat better position than the

CHART 10: CHANGES IN "REAL" ANNUAL LABOR EARNINGS OF FARMERS AND WORKERS IN OTHER OCCUPATIONS, 1914–1925
(1914=100)



Source: See Table B, Appendix, p. 156.

farmer owner, with a total return of approximately $1,122 for his labor, which more closely approximates the labor return in other occupations and of which $488 was available in cash for living expenses.

[1] Based on the Report of the Secretary, 1925, p. 34. See preceding footnote.

These figures are the most favorable that can be secured from the available data,[1] and since they represent averages for the country as a whole, it is evident that there must be many worse cases as well as better ones. Although they are to be regarded only as approximations, they suggest clearly that from the point of view of investment or labor return, excepting during a few war years, there has been since 1909 a wide disparity between the economic position of farmers and that of other groups. They go far to explain the exodus from our farms since 1920 and the economic unrest of the agricultural community in post-war years; but the discussion in earlier parts of this chapter suggests that these conditions may be the culmination of a trend that was in evidence before the war, and in some respects as early as the beginning of the century.

Insolvency

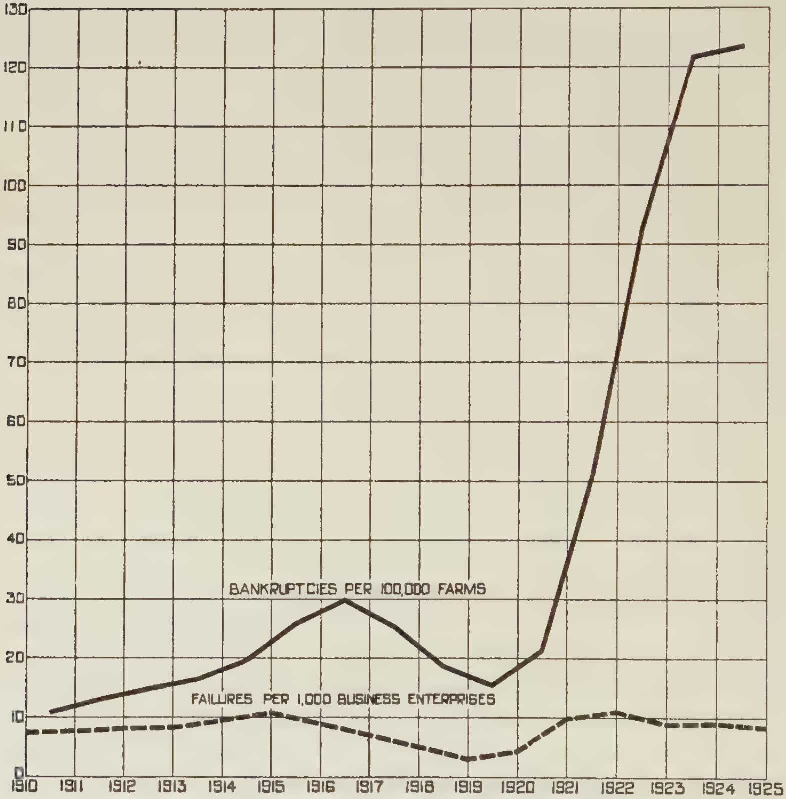
The effects of the conditions described in the preceding sections, and the disparity between the rural and urban economic position which they imply, may be most clearly illustrated by the comparative trend of commercial failures and farm bankruptcies shown in Chart 11 and Table 17. It is seen that although the rate of commercial failures is absolutely much higher than the rate of farm bankruptcies,[2] the rate has shown little variation from year to year since 1910, while the rate of farm bankruptcy rose almost steadily and rapidly throughout the period up to the middle of 1925, when it was more than ten times as high as in 1910–11. Farm bankruptcies increased at a more rapid rate than business failures from 1910 to 1916, diminished less rapidly from 1916 to 1919, and have risen faster since. They have increased markedly since 1922, while commercial failures have declined.

[1] The estimates of the Department of Agriculture (*Crops and Markets, op. cit.*, July, 1925) arrive at a figure of $876 net income in 1924–25, for labor and investment combined, of which $366 represents food and fuel supplied by the farm, leaving a total cash income of $510 for labor and investment. These figures, however, combine owner-operators and tenants without apportioning expenses or income as between tenants and owners, and make no allowance for rental value of the farm home.

[2] It must be noted that farm bankruptcies are obviously fewer than failures of farm enterprises, which may be simply abandoned, foreclosed, or sold for delinquent taxes. Such outcome is not reflected in these bankruptcy figures.

The tremendous increase from 15.5 per 100,000 in 1919–20 to 123 per 100,000 in 1924–25 is reflected in the decline in the value of the farm operators' investment from $47,223

CHART 11: COMPARATIVE CHANGES IN COMMERCIAL FAILURES AND FARM BANKRUPTCIES, UNITED STATES, 1910–1925



Source: Data on commercial failures are for calendar years, from Bradstreet's; those on farm bankruptcies are for fiscal years beginning July 1 from annual reports of U. S. Attorney-General as given in U. S. Department of Agriculture, Yearbooks.

millions to $32,720 millions in these five years, a loss of nearly $3 billions per year. It was only in this way that the industry was able to continue to pay overhead charges, taxes,

and operating costs after 1919. This is emphatic testimony upon the discrepancy between farm prices and capital, labor and operating costs, which has been in evidence since 1900.

TABLE 17: COMMERCIAL FAILURES AND FARM BANKRUPTCIES, UNITED STATES, 1910–1925[1]

Year	Number of Business Failures[2]	Number of Business Enterprises	Failures per 1000 Enterprises	Number of Bankruptcies among Farmers[3]	Number of Farms	Failures per 100,000 Farms
1910	11,573	1,592,509	7.3	679	6,361,502	10.7
1911	12,646	1,637,650	7.7	837	6,370,186	13.1
1912	13,812	1,673,452	8.2	942	6,378,870	14.8
1913	14,551	1,718,345	8.5	1,045	6,387,554	16.4
1914	16,769	1,749,101	9.6	1,246	6,396,238	19.5
1915	19,035	1,770,914	10.7	1,658	6,404,922	25.9
1916	16,496	1,790,776	9.2	1,906	6,413,606	29.7
1917	13,029	1,828,464	7.1	1,632	6,422,290	25.4
1918	9,331	1,824,104	5.1	1,207	6,430,974	18.8
1919	5,515	1,843,066	3.0	997	6,439,658	15.5
1920	8,463	1,958,042	4.3	1,363	6,448,343	21.1
1921	20,014	2,049,323	9.7	3,236	6,433,127	50.3
1922	22,415	2,074,617	10.8	5,940	6,417,911	92.6
1923	19,159	2,136,921	9.0	7,772	6,402,695	121.4
1924	19,712	2,195,626	9.0	7,872	6,387,479	123.2
1925	18,859	2,242,317	8.4	..	..	..

[1] Commercial failures from Bradstreet's; farm bankruptcies from Annual Reports of U. S. Attorney-General, as given in U. S. Department of Agriculture, Yearbooks.

[2] Calendar years.

[3] Fiscal years beginning July 1.

Conditions in Special Sections

These disparities and their effects have not been the same in all sections or all branches of the industry. The scope of the present report will not permit detailed examination of conditions by states or commodities. It is evident, however, that since the figures already given are averages, conditions in some sections of the country and branches of the industry must have been as much worse as those in others were better. In general it appears that the producers of wheat, corn, cattle, hogs and cotton have felt the effects of the post-war readjustment most severely, while the producers of dairy products, fruits and vegetables, especially those in proximity to urban markets, have been less severely affected. This may be seen by comparing the figures showing the distribution of the various major branches of production, given in

Table 4, with the figures in Tables 18 and 19 showing the distribution of income and the changes in per capita income of the farm population in 1919, 1920 and 1921.

Taking first the share of the farm population in the current income, Table 18 shows the relation between the proportion which the farm population formed of the total in the major geographic divisions and the share of the farm population in the total current income of each section. It is clear that, in 1921 especially, the disparity was most marked in the divisions where the grain and livestock branches of the industry are concentrated. In only one section, the Pacific States, in which the agricultural interest is primarily in the production of fruits and other specialties, was there in any of the three years a close approximation of the share of income of the farm population to the proportion which the farm population was of the total. The divergence was greatest in the New England States in 1919 and in the West North Central States in 1921.

TABLE 18: PERCENTAGE OF TOTAL CURRENT INCOME RECEIVED BY FARM POPULATION, BY SECTIONS, 1919–1921

Geographic Division	Per Cent of Total for Geographic Division			
	Current Income			Population Living on Farms in 1920[2]
	1919	1920	1921	
Continental United States	17.7%	13.4%	9.9%	29.9%
New England	4.8	4.6	5.1	8.5
Middle Atlantic	5.0	4.6	3.9	8.5
East North Central	14.7	11.1	8.4	22.9
West North Central	32.9	21.2	13.0	41.2
South Atlantic	27.1	20.4	15.2	45.9
East South Central	35.9	27.3	24.5	58.3
West South Central	34.6	28.3	19.2	51.0
Mountain	30.1	26.0	19.9	35.0
Pacific	18.0	17.4	13.2	18.2

[1] Based on National Bureau of Economic Research, "Income in the Various States," *op. cit.*, p. 282.

[2] Census of Agriculture, 1920, Vol. V, p. 894.

Table 19 shows in greater detail not only the disparity between the per capita current income of the farm population and that of the non-farm population, but the much greater extent to which the former suffered from the deflation in the

TABLE 19: PER CAPITA CURRENT INCOME OF FARM AND NON-FARM POPULATIONS, BY STATES, 1919–1921[1]

State and Geographic Division	Per Capita Non-Farm Population				Per Capita Farm Population			
	1919	1920	1921	Per Cent Increase or Decrease 1919–1921	1919	1920	1921	Per Cent Increase or Decrease 1919–1921
CONTINENTAL UNITED STATES	$723	$816	$701	− 3.1	$362	$298	$186	−48.6
New England	744	877	727	− 2.3	406	467	437	+ 7.6
Maine	592	706	617	+ 4.2	392	374	341	−13.0
New Hampshire	636	742	620	− 2.5	296	372	379	+28.0
Vermont	602	696	585	− 2.8	339	444	387	+14.2
Massachusetts	794	949	788	− 0.8	510	625	574	+12.5
Rhode Island	739	867	759	+ 2.7	521	615	508	− 2.5
Connecticut	725	850	641	−11.6	464	545	570	+22.8
Middle Atlantic	812	926	811	− 0.1	507	489	422	−16.8
New York	928	1,045	958	+ 3.2	537	612	470	−12.5
New Jersey	735	828	705	− 4.1	565	566	419	−25.8
Pennsylvania	698	817	672	− 3.7	368	374	276	−25.0
East North Central	742	841	680	− 8.4	427	367	217	−49.2
Ohio	738	844	626	−15.2	379	327	190	−49.9
Indiana	628	757	610	− 2.9	371	269	135	−63.6
Illinois	822	898	814	− 1.0	544	371	166	−69.5
Michigan	756	881	628	−16.9	363	381	255	−29.8
Wisconsin	610	689	579	− 5.1	463	496	359	−22.5
West North Central	666	736	655	− 1.7	463	284	142	−69.3
Minnesota	670	738	647	− 3.4	406	257	142	−65.0
Iowa	657	730	621	− 5.5	559	240	137	−75.5
Missouri	670	771	708	+ 5.7	324	228	124	−61.7
North Dakota	529	573	512	− 3.2	510	360	187	−63.3
South Dakota	708	649	569	−19.6	669	347	150	−77.6
Nebraska	694	738	670	− 3.5	483	284	99	−79.5
Kansas	663	731	652	− 1.7	487	395	186	−61.8
South Atlantic	602	655	561	− 6.8	261	201	123	−52.9
Delaware	861	778	667	−22.5	348	299	178	−48.9
Maryland	740	846	716	− 3.2	312	288	168	−46.2
District of Columbia	956	1,095	1,176	+23.0	534	355	268	−49.8
Virginia	574	596	528	− 8.0	214	202	124	−42.1
West Virginia	564	725	546	− 3.2	207	204	151	−27.1
North Carolina	500	523	431	−13.8	275	217	156	−43.3
South Carolina	555	544	438	−21.1	298	192	99	−66.8
Georgia	552	561	487	−11.8	256	165	84	−67.2
Florida	463	504	450	− 2.8	277	242	164	−40.8
East South Central	532	576	517	− 2.8	211	156	110	−47.9
Kentucky	574	667	606	+ 5.6	213	170	109	−48.8
Tennessee	531	574	529	− 0.4	192	165	121	−37.0
Alabama	483	513	430	−11.0	200	140	109	−45.5
Mississippi	541	508	470	−13.1	241	149	100	−58.5

[1] Based on National Bureau of Economic Research, "Income in the Various States," New York, 1925, pp. 260 ff.

TABLE 19: PER CAPITA CURRENT INCOME OF FARM AND NON-FARM POPULATIONS, BY STATES, 1919–1921[1]—*Continued*

State and Geographic Division	Per Capita Non-Farm Population				Per Capita Farm Population			
	1919	1920	1921	Per Cent Increase or Decrease 1919–1921	1919	1920	1921	Per Cent Increase or Decrease 1919–1921
West South Central	$632	$695	$602	− 4.7	$315	$267	$145	−54.0
Arkansas	562	542	478	−14.9	243	192	126	−48.1
Louisiana	547	618	540	− 1.3	240	164	108	−55.0
Oklahoma	680	736	579	−14.9	354	298	137	−61.3
Texas	666	748	669	+ 0.5	360	327	171	−52.5
Mountain	686	732	641	− 6.6	539	485	315	−41.6
Montana	759	760	611	−19.5	427	386	305	−28.6
Idaho	638	624	551	−13.6	587	523	342	−41.7
Wyoming	811	923	874	+ 7.8	958	746	487	−49.2
Colorado	704	773	729	+ 3.6	609	569	328	−46.1
New Mexico	532	569	536	+ 0.8	375	344	233	−37.9
Arizona	751	795	567	−24.5	533	537	319	−40.2
Utah	577	626	543	− 5.9	449	392	237	−47.2
Nevada	820	972	850	+ 3.7	1,064	832	628	−41.0
Pacific	798	895	847	+ 6.1	772	857	614	−20.5
Washington	745	750	716	− 3.9	614	659	533	−13.2
Oregon	756	752	678	−10.3	630	621	451	−28.4
California	825	977	926	+12.2	916	1,064	726	−20.7

[1] Based on National Bureau of Economic Research, "Income in the Various States," New York, 1925, pp. 260 ff.

period. In 1919, the best of the three years in respect to agricultural as well as general business conditions, we find only five states, California, Wyoming, Nevada, and North and South Dakota, in which the per capita current income of the farm population approximated that of the non-farm population. In 1921 there were no such states.

In general, the per capita income of the non-farm population, depending as it does so largely on wages and salaries, shows greater stability from year to year, despite unemployment, than is true of the farmers' income. The latter shows also a greater disparity from section to section, while the former tends to be more uniform throughout the country. For the country as a whole the per capita income of the non-farm population decreased only about 3% from 1919 to 1921, while that of the farm population declined nearly 50%. In the West North Central States, the grain, hog and cattle

section, the decline in per capita income of the non-farm population was 1.7%, while that of the farm population was nearly forty-one times as great, or about 70%.

Similarly marked changes are shown in the per capita income of the farm population in the cotton states, while the declines were less marked in the Pacific and Middle Atlantic States. It is noteworthy that certain states, such as Wisconsin, in which there are large dairy production interests, showed a considerably smaller decline in the per capita farm income in these years. In the New England States, where the farmer is engaged chiefly in producing specialties for a nearby urban market, it is striking that the per capita income of the farm population actually increased from 1919 to 1921, although, as has been noted, it shows a wider disparity with that of the non-farm population than is true in other sections.

These conditions are reflected also in the bankruptcies of farmers in certain of the most important agricultural states, as shown in Table 20, comparing the bankruptcy rate in 1910 with that in the years from 1920 to 1925.

TABLE 20: FARM BANKRUPTCY RATES[1] PER 100,000 FARMS IN LEADING[2] AGRICULTURAL STATES, 1910–1925

States	Fiscal Years Ending June 30						
	1910	1920	1921	1922	1923	1924	1925
Texas	5.7	13.1	18.5	27.2	55.7	81.5	73.5
Iowa	39.2	16.9	35.1	172.4	229.1	310.6	403.3
Illinois	17.1	12.2	4.7	34.8	83.4	85.1	84.2
Ohio	11.8	7.0	9.0	25.4	62.5	84.6	87.5
California	78.2	50.1	46.9	87.9	142.0	177.9	214.8
Kansas	7.9	18.8	27.2	68.3	135.8	159.3	128.4
Missouri	5.8	9.5	8.4	23.3	40.2	91.2	110.2
Oklahoma	7.4	6.8	6.7	19.6	41.5	70.3	73.5
Georgia	13.4	41.5	80.8	205.5	282.0	324.4	320.4
Nebraska	11.6	8.8	6.4	47.7	104.4	135.4	139.4

[1] Based on cases concluded in Federal courts, as given in U. S. Department of Agriculture, Yearbooks, and on number of farms in 1910, 1920 and 1925, as given by the Bureau of the Census.

[2] Basis of selection: Total crop values reported for census of 1920.

SUMMARY

Although the position of the agricultural industry since 1920 has in large part been due to the profound disturbances

of the war period, analysis of the long-time trends of the basic economic factors in the industry suggests that, since the beginning of the century, conditions have arisen which have tended unfavorably to affect the relative position of the industry as a whole. This is reflected in the contraction of our agricultural "plant" and its output in relation to our population growth; in the increasing effectiveness of foreign competition in both foreign and domestic markets; in the relatively greater increase in production costs per unit than in prices per unit; and in the declining relative per capita share in the national income of persons engaged in agriculture.

This trend, in evidence before the war, was emphasized during and after the war period, with exception of a few war years. It is reflected in the decrease in real agricultural wealth, in the comparatively low rate of return for investment, in the disparity between the labor rewards and per capita income of those engaged in agriculture and other groups, and in the steady and rapid growth of farm bankruptcies since the pre-war period, particularly in the sections where the grain and livestock branches of the industry are concentrated.

There has been a distinct and rapid improvement in the economic position of the average farmer since 1921; but in the latest year for which information is available there still remains a wide disparity in the position of workers and investors in the industry and other groups, which has been in evidence for a long period. It remains to be seen whether the great deflation which agricultural values have suffered since 1920, the abandonment, foreclosure, and bankruptcy of farms, the exodus of the farm population, and the general contraction of the industry that have taken place in the past five years are merely the passing consequences of the war or are a phase of a transition through which the agricultural industry has been passing during the past generation in the readjustment to the new economic system that has developed since 1900.

CHAPTER III

FACTORS IN AGRICULTURAL INCOME

Leaving out of consideration return from increase of land values, and from other investment or work by farmers,[1] the income of agriculture as a whole is obviously determined fundamentally by the value of the products it sells outside the industry and the value of what it consumes directly for food and fuel.

Direct Consumption

The latter, as has been seen, is a relatively constant factor in agricultural income, amounting to about 20% of the gross income and about 40% of the net income.[2] It is therefore vitally important in that it determines the minimum income of the industry. The more it can be increased, clearly the more secure the industry will be.[3] Generally speaking, in the present position of the industry it would be impossible for farmers to continue in agriculture except for the fact that the farm furnishes a home and part of the food and fuel required. This is one of the reasons why corporate agricultural enterprises, based on a wage-earning working force, are not often successful.

The larger and more variable element in gross income, upon which the industry must rely for meeting its external costs, however, is the value of its products sold. What are the factors which influence this value?

[1] These also depend in part upon changes in the agricultural income from production itself. In periods of rising income farmers invest their savings in more land, or take up more land on a rental basis. In the war and post-war period there was also some investment in industrial and governmental securities. It is doubtful whether these investments added much to the agricultural income during this period; but the diversification of interests in the sense of investment of savings in sound securities during good years is of great importance in stabilizing agricultural income. There have been, however, few years in which such savings could have been realized by the average farmer. See pp. 56, 57.

[2] After business expenses are paid.

[3] It is interesting to observe that in the depression of 1921–22 the percentage of direct income increased considerably. See Table 6, p. 20.

There are four basic and closely interrelated factors which determine the gross agricultural income from products sold outside the industry:[1] the total output or the potential supply; the effective demand; the actual sale or marketing of the product; and the price received by the producer for it. These factors do not operate separately and successively, but together and upon one another. They nevertheless should be distinguished, for they present different problems from the point of view of control of the farm income.

Production

The supply of agricultural products available for sale from year to year is basic in agricultural income. This depends, in the first place, upon the acreage planted and cultivated, and secondly upon the actual yield.

Acreage

The acreage planted and cultivated depends upon the acreage made available for production and settled with producers. Here the influence of government, local agencies, changes in land values, credit conditions and other factors enter, increasing or decreasing the acreage given over to various kinds of production, through irrigation, reclamation, inducements to settle, homestead laws, expansion or restriction of credit, etc. Throughout, in addition to these influences, the anticipation and foresight of farmers regarding the relative market demand for, and price of, various agricultural products, as well as regarding the prospects of agriculture as a whole, play an important rôle; but in many cases natural conditions or other factors have a larger influence upon planting than have prices.

It is apparent that some of these factors, which may have a far-reaching influence on the general agricultural income, in so far as it depends upon a balance between production and demand, are inherent or natural and some artificial or circumstantial.

The land area of the country and of the world is, of course,

[1] This discussion refers primarily to farm crops. Indirectly, the income from production of animal products depends ultimately on similar factors.

the theoretical upper limit of acreage; but in practice the limit of cultivation is fixed by the relation between cost and possible income itself.[1] Certain land areas it will probably never be possible to cultivate without a far lower return than the present standards of living require for the farmer or without prices which would involve far lower standards for the urban population. But at all times, because of wide changes in prices, there are brought under cultivation areas which may be called "marginal"—that is, on which the return is only equal to or even less than the cost. Ultimately, in respect to products having a general market, and especially those having a world market, it is the supply from these sources that determines the price of the whole and therefore the general level of income for the producers on all lands.

Moreover, if the supply from such sources is produced at lower cost than the rest by reason of lower standards of living of the producers or by consuming and not replacing the fertility of the soil, the income of all producers whose product enters into general competition with the other tends to be reduced, because the general price is reduced to the level fixed by the lowest cost producer whose product enters the general market. Price changes, due to changes in crop yield or other factors, tend to expand or contract the margin of cultivation; but these changes are slower than in other production because agricultural production is slow. They are influenced by the amount of capital investment necessary, the availability of credit, the general level of income and prevailing standard of living of farmers, the amount of virgin land available, and the expectation of profit from increase in land values. So long as many farmers are willing to accept lower standards of living, or do so in the expectation of compensation through increasing land values,[2]

[1] That is, in the long run, through the gradual operation of economic forces, rather than through the immediate calculations of individual producers.

[2] There is some basis for the view that American agricultural development hitherto has been dominated by a "real estate complex" rather than by sound economic influences—that is, the expansion of acreage, especially in the early periods of cheap virgin land and homestead laws, and until very recently has been influenced by the prospect of increase in land values rather than by consideration of the possibilities of return from production. This in part explains why the exodus from agriculture has not been greater in view of the wide disparity in return for labor which has existed for more than a quarter century.

and so long as the utilization of land resources is uncontrolled by any general policy, these fluctuations of acreage will continue and will affect the income of all producers. These processes of contraction and expansion of acreage in the various major crops are constantly going on in the United States and other countries and account for a part of the great instability of income of producers in settled regions of diminished fertility, and with high costs, large investment, and better living standards.

Price changes, nevertheless, are not always the dominant factor in the fluctuations of acreage.[1] This is largely because the credit conditions and weather conditions at the time of planting, the requirements of the rotation program, the condition of the land as to weeds, the prevalence of plant diseases, the introduction of new types of seed, must all be taken into consideration by the farmer in addition to his estimate of the prospective relative profitableness of the crop.[2]

It is evident, however, that whatever influences may assist in preventing over-extension of acreage as a whole, and in special lines, and every means which may help to adjust the putting of land under cultivation from year to year to real demand, so far tend to stabilize and sustain the general agricultural income.[3] Among the artificial or circumstantial obstacles to such control are local self-interest, the colonization efforts of railroad companies, those of local immigration bureaus and commercial organizations, lack of prompt and comprehensive information regarding planting intentions of other farmers and market prospects, and the lack of any definite national policy in regard to the classification and utilization of our land area.

It must be recognized that, since the beginning of the

[1] Studies by the Department of Agriculture in respect to particular crops in special sections indicate that price factors at planting time account for from 30% to 60% of increases in acreage.

[2] It should also be mentioned that the use of motor power on farms has tended to release for crop production and to facilitate putting into crops much acreage formerly required for feeding livestock to supply farm power.

[3] If the acreages in the major crops are compared with those for the minor ones (see p. 14) it is evident that relatively small reductions in the acreages in corn, wheat and hay and their transference to potatoes, for instance, may cause enormous variations in the production and prices of the minor crops while they affect the production and price of the major crops relatively little.

decline in the relative importance of our exports of agricultural products in the period 1900–1910, it has been the implicit policy of government to encourage increased agricultural production, frequently without regard to the consequences for the income of the industry as a whole. The conservation movement, beginning about 1900, was the first reflection of this, and hitherto it has had the form of extending the cultivated area through reclamation and irrigation of marginal lands. It is probable that in large part this policy has led to waste rather than conservation of our land resources. The lowering of the general level of income for producers generally, through competition with producers on marginal lands, supported in part by governmental aid, as well as through the general decline of prices following the war, has made it necessary for producers in settled areas to defer the maintenance of their land fertility in order to make ends meet.[1]

In large part, however, the difficulties are inherent in the nature of the agricultural industry—the individualized and unorganized character of its enterprise, the wide instability of prices, the fact that it takes time and capital and special skill to bring land under cultivation for different purposes, and that labor, skill and capital are not easily transferable, within the industry or to other industries. The more the wide price fluctuations can be stabilized, the more the producers in settled regions can through organization regulate their acreage and cultivation in the light of general conditions of demand and supply, the more agricultural production can be based upon the standards of return for labor and investment in other occupations rather than upon the willingness to endure lower standards and to sacrifice land fertility in prospect of eventual gain from rising land values, and, finally, the more a wise national policy in the utilization and reclamation of lands can be formulated and carried out, the more stable will be the development of the productive

[1] See p. 135. The producers on reclaimed lands have been the worst sufferers, however, and the difficulties that have arisen through the economic unsoundness of some reclamation projects have led to a revision of the governmental policy in this connection. It must be noted, too, that many of these projects have been undertaken under the pressure of local interests.

"plant" capacity of the industry—that is, the land acreage under cultivation.

Yield

Once the land is put under cultivation, however, the uncertainty does not end. The agricultural output depends not only upon the acreage but upon the yield per acre.

Here, too, artificial or circumstantial factors play a rôle in affecting the balance of production. Anticipation of market conditions stimulates or deters farmers in cultivation or in harvesting.[1] The size of farms, influenced often by a speculative interest in land values on the part of farmers, affects the intensiveness of cultivation.[2] Knowledge of improved agricultural technique is another element. The cost of labor, implements and fertilizer are others.

But at bottom this aspect of agricultural supply is dominated by the inherent natural characteristics of the agricultural industry. Production per acre is determined ultimately by natural factors—the fertility of the soil, the influence of plant pests, weeds, diseases and the weather, especially the rainfall. Over these, except as better scientific knowledge may help, the farmer can have little control, in so far as adjusting the volume of production to demand is concerned. More intensive cultivation alone, through the use of more labor and capital, may increase production within certain limits, if the weather permits; but this likewise usually increases costs and may not increase income proportionately, if at all, because generally increased production tends to lower prices.

The fluctuations in yield per acre are a more important factor in the instability of agricultural income than the changes in acreage. The yield per acre may vary enormously with the temperature and rainfall. In 1915, for instance, with a rainfall of 10.16 inches the yield of winter wheat on one farm in Wyoming was four times as great as the yield in 1913,

[1] In many sections, as, for example, the cotton raising districts, the acreage planted and the harvesting are largely dependent upon the extent and the length of time to which the local merchant or banker are able to "carry" the farmer.

[2] It is important to note here that farms operated by tenants and part owners are considerably larger, on the average, than owner-operated farms. In this way tenancy may affect the degree of cultivation.

with a rainfall of 7.14 inches.[1] In addition, the effect of storms, plant pests, weeds and diseases increase the uncertainty. For these reasons or because of unfavorable price outlook, a large part of the planted acreage of crops is destroyed or abandoned annually. In 1919 this acreage amounted to 15 million acres, or about 5% of the total land in crops; and in some years as much as 30% of the acreage in wheat is not harvested.[2] Moreover, the yield and the price are not at all interdependent, so that the income has no stable relation to the yield. Because of this uncertainty the producer is, in general, driven to secure the maximum yield at the lowest direct cost, with the result that he commonly sacrifices his land resources in the effort to produce enough to offset the instability of prices. A part of his income thus derived is, of course, not income at all, but consumption of his basic capital.[3]

In short, while the acreage and the degree of cultivation may be influenced in the long run by the individual calculations of farmers regarding relative costs and income, or even by organized action, it is clear that the supply of agricultural products in any country from year to year is controllable in relation to the market at the most only gradually and within the widest limits, because of the inherent nature of the productive process and the instability of prices. It is a natural long-time process, carried on by a vast number of unorganized individual, proprietary producers, whose capital, special skill and labor are relatively inflexible[4] or immobile. In face of the great number of unorganized individual producers of the major products and in view of the instability of the prices upon which they base their individual production plans, it is difficult to see how any effective co-ordination of production with demand can be developed, even supposing demand were

[1] Cited in J. Russell Smith, "The World's Food Resources," New York, 1919, p. 28.

[2] U. S. Department of Agriculture, Yearbook, 1923, pp. 423, 603.

[3] See p. 135.

[4] It may be noted that tenancy, or corporate agriculture, from the point of view solely of production, would seem to afford greater flexibility than individual proprietary farming, although there are offsetting disadvantages. In European countries, where the proportion of tenancy is high and many farm workers live in villages, there appears to be a greater elasticity of adjustment of agricultural production in relation to industrial conditions.

constant, which it is not. Agricultural production involves at present unusual risks against which individual foresight alone is likely to be of only limited effectiveness. The reduction of these risks in the future depends largely upon better knowledge for the forecasting of weather conditions, and possibly even control of certain weather factors;[1] upon more prompt and comprehensive information regarding prospective supply and demand; upon the influence of world production; upon gradual adjustment of domestic acreage to population and demand; upon organization in controlling the effective supply; and upon stabilization of prices.

Influence of World Supply

Many important agricultural products are "international" commodities, produced and consumed in all countries. Each unit of them is indistinguishable from others. With modern facilities they are freely transportable at relatively low cost. It is therefore not merely the domestic production that affects the agricultural income in the United States but the relation of the world production to the domestic production. In other words, except for the influence of tariffs, and of transportation costs on the more bulky commodities, it is the world supply that is the effective supply in the domestic market.[2]

The factors which determine the effectiveness of the world supply in the domestic market will be more apparent when the relation of demand, marketing and price to agricultural income are discussed. It is evident, however, that the difficulties involved in the control of domestic supply are greatly magnified when the world supply is considered. The producer has to adjust his acreage in the light not only of the prospective domestic production but of the world output with which it will have to compete either in the domestic or foreign market. The outlook in respect to world production

[1] Great scientific progress is being made in these directions through meteorological and astronomical study and through experiments in effect of artificial light, irrigation and temperature control on crops. Some crops, like tobacco, are increasing subjected to "artificial" weather influences. The control of plant diseases and pests likewise belongs in this category of factors which science is helping gradually to control.

[2] This is not true of all agricultural products, but of the most important. See pp. 89 ff.

is therefore most important in relation to the agricultural income in this country.

Two major tendencies are to be noted in this regard. In the first place, there has been a tendency since the end of the war for other nations to expand their acreage. The principal wheat producing countries, in millions of acres devoted to this crop, are: Russia, 74[1]; United States, 55; India, 31; Canada, 22; France, including possessions, 21; China, 20; Argentina, 18; Italy, 11; Australia, 11. In 1925 the wheat acreage in these countries, excluding Russia and China, had increased over the average for the years 1909–13 as follows: India, 9%; Canada, 121%; France, 38%; Argentina, 20%; Australia, 32%; and the total world acreage about 12%; while that of the United States increased about 11%. The acreage of Italy in 1925 was almost equal to pre-war, as was that of all European countries combined.[2] Moreover, in practically all other producing countries, partly because of virgin land, low labor costs and high fertilization, the yield per acre is higher than in the United States. The European countries, especially, because of their economic situation, have been making special efforts to increase production and to diminish their dependence on outside sources.

Nevertheless, despite this tendency during the post-war years, it does not conclusively appear that production is increasing faster than population for the world as a whole. Indeed, the world production (including the United States) of the principal commodities in 1924 compared with the pre-war as follows:[3]

	1913	*1924*
Wheat, bushels	4,087,000,000	3,472,739,000
Corn "	3,744,000,000	3,721,000,000
Rye "	1,893,000,000	1,419,990,000
Oats "	4,798,500,000	4,184,000,000
Barley "	1,779,000,000	1,382,000,000
Cotton, bales	26,259,000	24,700,000
Wool, pounds	2,881,000,000	2,837,000,000
Swine, number	259,000,000	221,967,000
Tobacco, pounds	2,660,000,000	3,100,000,000
Potatoes, bushels	4,719,000,000	4,446,000,000

Studies made by the Conference Board, covering the per capita production of the principal crops, according to their

[1] Pre-war figures, including Asiatic Russia.

[2] U. S. Department of Agriculture, *Foreign Crops and Markets*, Jan. 18, 1926.

[3] U. S. Department of Agriculture, *Foreign Crops and Markets*, *passim*.

caloric food value, indicate that since 1912 the trend has been downward for the world as a whole, although such estimates are necessarily inconclusive because of the wide margin of error involved in both population and production figures.[1]

Thus the resumption of agricultural production in foreign countries in the post-war years has probably only obscured the tendency for production to adjust itself to demand. It may be doubted whether over any considerable period there is likely to be any surplus of agricultural production above its needs for the world as a whole. With the growth of population the exporting countries are likely to require more for their own support and the importing countries to increase their own production to the maximum.

The Outlook for Domestic Production[2]

These considerations are emphasized in the case of the United States. The increase in agricultural production during the war period and the "surplus" in the post-war years were in large part only apparent. The marked growth of cereal exports during the decade 1913–22 was not the result of a sudden expansion of the per capita area of land in crops. From 1900 to 1925 the trend of crop acreage per capita was downward, and in the period 1919–22 the per capita acreage in twelve principal crops was 10% less than for the period 1899–1903. The "surplus," which has in large part been the source of agricultural depression since the war, was partly the result of an increase in the acreage of cereals, especially wheat, at the expense of other crops, and partly due to the falling off in domestic demand in 1920–22. The average acreage in the five cereals in 1919–22 exceeded that of the pre-war period, 1909–1913, by about twenty-three million acres, of which wheat accounted for more than eighteen million acres. This increased acreage was made possible by a reduction in that used in producing for domestic uses, especially for feeding livestock. From the pre-war period, 1909–1913, to 1919–22 the per capita acreage employed in producing for domestic consumption declined nearly 6%.

[1] Unpublished MS.

[2] Except where otherwise noted, figures in this section are from U. S. Department of Agriculture, Bulletin No. 896, 1924. See Tables 8–10, and Charts 1–6, and 9.

Most of the acreage thus economized was diverted to increasing the production of wheat under the stimulus of high prices and of patriotic appeal during the war period. But even during that time the per capita production of the major crops taken together was not markedly higher than pre-war. The average for the five-year period 1915–19 was 0.4% lower, and that for 1920–24 was 4.8% lower than the average for the pre-war period 1910–13.[1] The apparent surplus was due partly to the shifting of the balance of production and partly, as will be seen later, to the decline of effective domestic and foreign demand in 1920–22.

The acreage in wheat, however, has been rapidly returning to normal. Although in 1923 it was still 27% larger than the average of the five years before the war and in 1924 and 1925 it was about 11% higher than pre-war,[2] in view of the population increase in the past decade, this indicates a definite tendency toward readjustment of supply and demand.

This readjustment, however, has been accompanied by disturbance and distress which illustrate both the importance and difficulty of control of production. After new land, some of it range, was broken up and put into wheat, houses built, livestock and implements purchased and debts incurred, it was not easy to let the land go back to pasture or to shift it to other uses. In large areas of the Northwest the process has simply meant abandonment of land and equipment. Moreover, as has already been pointed out, the transference of a relatively small proportion of the acreage in one of the major crops to a minor crop is likely to result in overproduction of the latter, while the output of the former is relatively little affected. The subtraction of ten million acres from the corn area, for instance, and its transfer to potatoes or other smaller crops, might easily double the production of some of these. Thus, even though the total acreage in crops is kept under control, the shifting of acreage as between the various branches of production under the influence of price changes may upset the equilibrium of agricultural income.

[1] U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, Dec., 1925, p. 379. See Table 10 and Chart 4.

[2] *Foreign Crops and Markets, op. cit.*

All evidence points to the fact that the apparent surplus of cereal products, due to reduction in the per capita acreage of land employed for producing livestock for domestic consumption, and to the over-expansion in the per capita acreage of wheat and rye at the expense of other crops, has merely obscured temporarily the increasing scarcity of land in the United States, in relation to domestic demand. Under the gradual operation of economic forces, some degree of adjustment of production, at least in respect to acreage put into the major crops, has undoubtedly taken place in the United States. Data given in the preceding chapter show that the acreage in farms in proportion to the total population has declined almost steadily since 1860, from 13 acres per capita to 9 in 1920. The per capita acreage of improved land has declined steadily since 1890 and is now about the same as it was in 1850. The per capita acreage of land in crops has declined since 1900 and is now below the point at which it was in 1880. These declines in acreage were offset up to about 1900 by an increase in the yield per acre of the nine principal crops, but since that time the yield per acre has shown no increase, and in consequence the per capita production of the principal crops, as Charts 3 and 4 indicate. has shown a tendency to decline almost steadily since 1900, The number of livestock per capita has also declined about 30% since 1893. The wheat acreage has undergone a great reduction since 1920.

In general, therefore, as to the outlook in respect to production in the United States, there appears to be progressively less likelihood of over-expansion in the future than there has been in the past. Practically all the readily available land for crop production and pasture is now in use. Extensions of acreage are likely to be largely at the expense of pasture, and otherwise only at increasing cost. As has been seen, in comparison with other lines of activity, agriculture by and large is not so profitable under normal conditions that there is any great incentive to extend the margin of cultivation, extensively or intensively, much beyond requirements determined by demand. The average farmer and his family under present conditions are working so hard, and the overhead charges for interest and taxes are so high,

that stabilization or even moderate increases in prices would hardly be likely to stimulate any considerable general over-expansion of acreage or production.

There is, however, for a long time in the future the possibility of such shifting to special crops within the acreage as a whole as occurred during the war, and which, because of the slowness of readjustment, create difficulty thereafter. Such difficulties are intensified in the degree to which individual farmers or sections devote their whole acreage or a large part of it to single cash crops under the stimulus of abnormal demand. Even in normal periods the effect on the agricultural income of fluctuations in yield, demand and price is much diminished by broader diversification of production by the individual producer.

Demand

The demand for agricultural products, although in many respects more stable than the total supply, also tends to vary widely under the influence of factors which are difficult to control. The principal factors are: changes in consumers' demand; changes in demand within the agricultural industry itself; changes in demand for industrial materials; and changes in world demand.

Consumers' Demand

The growing interrelationship of industry and agriculture has probably tended to increase the instability of demand and so to render agricultural income the more uncertain. The consumption of foods is relatively inelastic and stable; it changes, broadly speaking, only with the slow and gradual changes in population. But even in respect to foods, the development of industrial urban population has tended to increase the instability of consumption. The dietary habits of this consuming population change not only with slow changes in education, custom and hygienic ideas; but with fluctuations in industrial conditions and prices.[1] The con-

[1] Changes in tax burdens also affect the purchasing power of consumers. It has been shown in studies by the National Industrial Conference Board that in some cities the per capita taxation exceeds in amount the total annual per capita expenditures for food among wage earners' families.

sumption of meat, for instance, is affected by dietary education and the high price level of meat products. Moreover, as the employment and earnings of industrial workers vary, and standards of living change, there take place shifts from low price to high price foods. In European markets, for instance, Argentine beef has been increasingly substituted for pork. Under relative price changes lard or oleomargarine is substituted for butter. In periods of depression the demand for cereals relative to that for animal products tends to increase. As the industrial population grows, all these gradual changes and recurrent fluctuations have an increasingly important influence upon demand.[1]

Agricultural Producers' Demand

In addition it must be remembered that large sections of the agricultural industry are, like manufacturing industries, users of the raw farm products produced by other sections. The dairy farmer, the poultry and egg producer, the hog and cattle raisers form a large part of the market for the producer of cereals and cottonseed products, and the conditions in the former branches of the industry affect the demand for the products of the latter.[2] These interrelationships are of great importance in considering the effects of changes in the price of certain agricultural products which are the raw

[1] Changes in demand due to alterations in consumption standards are partly a cause and partly an effect of changes in agricultural conditions. In either case they are probably of more importance than is usually conceived. The declining per capita consumption of beef is partly due to dietary ideas and partly to rising prices which reflect the scarcity of grazing land and consequent high costs of production. This has been somewhat offset by an increase in consumption of pork and pork products and veal. There is some evidence, too, that the consumption of fruits, especially citrous fruits, vegetables and dairy products, has increased relative to that of starchy cereals. The per capita consumption of flour has declined 24% since 1880. It is not impossible that the displacement of food preparation from the home to the factory and restaurant, too, has had some influence upon the aggregate consumption. Although it has been estimated by the Anti-Saloon League that the farmer received about 19 cents of every dollar spent for malt and distilled liquors, and the Food Administration made a great point of this matter during the war, it does not appear that prohibition of liquor manufacture has greatly affected the domestic consumption of agricultural products. The consumption of sugar has risen rapidly and while this is not an important domestic crop, imports undoubtedly displace some domestic demand for other sugars. Changes in costume also have an important relation to demand for agricultural products, but the shift from heavy wool to lighter clothing and the development of artificial fibres is too recent to allow comment on their possible effect.

[2] As is indicated in Table 5, about 27% of the gross value of products is used within the industry as raw material of production.

materials of other agricultural groups. The point of immediate importance here, however, is the fact that while the production of these materials is, as has been seen, so largely uncontrollable, the demand for them changes relatively more slowly, so that maladjustments are frequent. It is the hog population, for instance, that determines the demand for corn, and the number of hogs farrowed does not fluctuate in any close relation to the corn crop. When the latter is large and prices fall the number of hogs tends to increase, while for the same reason the future production of corn tends to be reduced, thus reversing the maladjustment. Even longer intervals prevent the quick adjustment between feed and livestock production in the case of cattle and horses.

Industrial Demand

Equally important are the fluctuations in demand which grow out of the fact that an increasingly large part of agricultural production has been devoted to industrial materials—not only the materials of the textile, leather, paper and pulp and lumber industries, but also the materials of the manufactured food industry. Since pre-war years the volume of goods manufactured from farm products has increased more than the volume of agricultural products themselves.[1] This indicates an increasing industrial demand relative to production. But since the production of the manufacturing industries utilizing farm products fluctuates widely and sharply in response to changes in demand and prices, while the agricultural production of their materials is less controllable, the maladjustment of supply and demand in this part of the agricultural industry tends to have an increasingly disturbing affect upon agricultural income.

It is probable that the periodic "surpluses" of agricultural products arise largely from the combination of all these influences upon demand, and particularly from the changes in industrial activity. The apparent surplus of farm products in 1920–22, as has been seen, was not due to any marked

[1] U. S. Senate, Joint Commission of Agricultural Inquiry, Report, Part I, p. 47.

increase in total production. Nor was it due altogether to the decline in European demand, as the following figures indicate:[1]

	Exports of Grain Products in Bushels	*Exports of Beef and Pork in Pounds*
1913	100	100
1918	171	263
1919	173	263
1920	169	154
1921	222	160
1922	201	145
1923	109	187

Thus, although the production of all farm products in the years 1920–22 was below the pre-war level, Europe was able to absorb more than before the war, and our exports of grain were higher in 1921–1922 than during the pre-war period. This was partly due to the low prices which prevailed, but these low prices themselves were a reflection of the decline of effective demand in this period due to industrial depression and post-war conditions. The average weekly earnings of wage earners in manufacturing industries fell about 25% from the middle of 1920 to the middle of 1921 and did not begin to rise till about a year later. The total payroll of manufacturing industries declined over 50%. The number of workers employed declined by over a third, and the average hours worked per week per wage earner, which indicates the degree of industrial activity, declined 10%.[2] This depression not only affected the industrial demand for agricultural products along with all other raw materials, but may have had an important effect on the expenditures for certain kinds of food among the working population.[3]

World Demand

As in the case of supply, all the influences on demand just noted are not merely domestic but international in scope in relation to the major agricultural products. The growth of

[1] U. S. Department of Commerce, "Survey of Current Business." See also E. G. Nourse, "American Agriculture and the European Market," New York, 1924, pp. 77–78; and Charts 5, 6, 9. It must be emphasized that, although the volume of exports declined little, there was a great decline in effective demand because Europe could not buy as much as formerly at the war-time prices.

[2] National Industrial Conference Board, "Wages and Hours in American Industry," New York, 1925.

[3] See Table 11.

population and the development and fluctuations in activity of industry in all countries are fundamental factors. In addition, changes in our international economic and political relations have an important influence upon the foreign demand for our agricultural products. Although in 1920–22, because of the shortage in production abroad as a result of the war, because of the failure of domestic demand and because of the low prices prevailing, as well as the extension of credit, European countries were able to absorb large quantities of our farm products, the situation has greatly changed since then. Not only have the nations sought to increase their own production, but their efforts to stabilize their currencies and to make payments on debts to the United States have made it desirable to reduce their imports as greatly as possible and to buy their necessary foodstuffs and materials in the cheapest market or in markets where they are in a creditor position. The extension of further credit to these debtor countries doubtless helps temporarily to sustain their demand for our agricultural exports, but study of the processes of international debt payment, governmental and private, indicates that ultimately the demand from importing debtor countries is likely to be relatively reduced through the creditor position which the United States has assumed, unless the American products can be bought by them at exceptionally advantageous prices. In either case a reduction of agricultural income is implied so long as there is a surplus the disposal of which depends upon foreign demand.[1] As has been seen, the existence of such permanent surplus for any long period in the future is doubtful, but the foreign demand will nevertheless probably play a rôle in the American agricultural income for some time. Experience has shown that the amount of wheat exported is not dependent solely upon the surplus available but upon relative prices and other factors, of which international exchange and credit relations are one.[2] In general, however,

[1] For a fuller discussion of this aspect of the problem see National Industrial Conference Board, "The Inter-Ally Debts and the United States," New York, 1925.

[2] It is interesting in this connection to note that Germany in 1925 bought American rye at a price 25% higher than that prevailing in that country because of the credit offered by American sellers.

the trend of our exports of farm products was downward for a considerable period before the war, as a result of the decline in our per capita production and increasing costs of production. Domestic rather than foreign demand, therefore, will probably be a factor of increasing importance in the agricultural income as time goes on.[1]

The Outlook for the Domestic Demand

Since our own population is growing at the rate of about a million and a half a year, and since agricultural production in Europe and other countries is rapidly expanding, it would seem clear that the stability of agricultural income can be increased as our food production is more nearly adjusted to the growth of our population and as the production of agricultural raw materials is expanded relative to the production of food, provided that the stability of domestic industry is increased and its steady growth not hampered. The domestic consumption, depending both upon the growth of our population and the development and stability of industry, is the most important factor in agricultural income so far as it is affected by demand. This is reflected in Chart 5, showing the decline in our exports of agricultural products since the beginning of this century.

Although we shall probably continue to devote a part of our acreage to production for export and although a constantly larger part of the demand for agricultural products will doubtless be filled by other sources of supply, there is no prospect that for the basic foods and materials which we produce, the demand in the United States will soon outrun our potentialities of production. According to competent estimates we shall be able to fill the food requirements of our probable population of 150 millions in 1950 with moderate changes in our standard of consumption and moderate increase of yield per acre by adding only about 40 million acres to our present area of crop land and improved pasturage.[2] That production will, however, involve progressively greater

[1] It should be noted, however, that even though the volume of our exports should steadily decline, world conditions of supply and demand will continue to play a dominant rôle in agricultural income so long as we have any surplus for export.

[2] U. S. Department of Agriculture, Bulletin No. 896, *op. cit.*, p. 495.

costs as well as some shifting of consumption under changing prices, so that domestic demand will tend more and more to precede and control expansion of production.

The problem in respect to industrial materials, like cotton, wool, pulp, hemp, silk, flax and other fibres, rubber, vegetable oils, etc., is closely related to the question of food production and is more serious. Except with respect to cotton our demand has already outrun the domestic output of such of these products as we raise. Some of these it may not be possible to produce profitably at home. But in so far as the acreage used for the production of these crops tends to keep down the excessive expansion of food crop acreage, the effort to increase the domestic production of industrial materials may have an important part in raising and stabilizing the agricultural income. The withdrawal from cultivation and utilization for reforestation of marginal land which, as has been seen, has so great an influence on agricultural income, is an important question to which the paper industry is giving increasing attention. Moreover, with the demand for wood and wood pulp outrunning the production, the farm wood lot may afford an increasing supplementary income. The marginal land is not all in the West. Every farm has a little of it which has to bear overhead costs like the rest.[1] Similarly, the utilization of wheat acreage for flax in some of the grain states is a movement in the direction of adjusting supply to demand.

Sales and Markets

Although the relation of potential supply and demand is the underlying factor in agricultural income, that income is in the end dependent chiefly upon the factors which influence the effectiveness of this relationship in actual practice. Supply and demand must be adjusted not only in the long run but continuously from season to season if agricultural income is to be made more stable.

The preceding discussion should have made it clear that

[1] Reforestation of course has added advantages in that it is vital for the preservation of soil resources and helps reduce the depreciation factor in agricultural costs. But for the promotion of this movement certain important conditions, such as a revision of our system of forest land taxation, are lacking.

over any considerable period there are no real surpluses of agricultural products.[1] In the long run the world demand tends to exceed the supply. The apparent surpluses exist in relation to particular markets or particular periods. They arise, first, from the fact that some countries or districts produce more than they need while others produce less; second, from the fact that the production is concentrated in short periods while the consumption is spread over a longer period; and, finally, from the fact that the production from season to season varies. The problem of adjusting supply and demand is therefore in part a problem of production control and in part a problem of marketing; and here again it is seen that some of the difficulties are inherent in the nature of agricultural production while others are artificial or circumstantial, arising from defects in the marketing system, or from the influence of tariffs and transportation conditions.

The production of agricultural products is seasonal; the demand also in part is seasonal, but is relatively inelastic. Agricultural produce is in part perishable, and it is marketed by a large number of widely scattered and largely unorganized producers. In large part agricultural products are not individualized, or trade-marked like manufactures. Finally, the markets are in large part international or distant from the producer so that trade barriers and transportation facilities affect the marketing process.

The effect of all these conditions has been to subject the agricultural producer to influences over which he has little if any control and which tend to render the unstable relation between potential supply and potential demand still more unstable. The real significance of these features of the marketing of agricultural produce is that they render it a homogeneous supply thrown on the market all at once by a vast army of scattered producers, and that, therefore, in technical terms, the marginal price—the price of the final

[1] That is, excesses over consumption. So long as agricultural production is not quickly controllable, however, there will be surpluses in the sense of an excess over the quantity which can be sold at a given time or in a given locality at a price sufficient to induce farmers to attempt and continue to produce that quantity. For a full discussion of the surplus problem see "Agricultural Surpluses," Report of subcommittee of the Special Committee on Marketing, Distribution, and Surpluses, U. S. Department of Agriculture, March 15, 1926.

unit added to the supply—is the price at which the whole crop goes. And this means, in respect to wheat, for instance, not merely the final bushel in the United States but the final bushel in the world.

The two aspects of this situation which are of most importance in relation to agricultural income are: First, the domination of part of the agricultural market by world supply and demand, and, second, the influence in the domestic market of lack of organization of producers.

World Market Influence

Of the major agricultural products sold, cotton, hogs, cattle, wheat, corn and tobacco are subject to a world market, and at times dairy products as well.[1] These constitute, in terms of value, more than 80% of the agricultural income from sales.[2] But there is a wide difference between the market situation of producers of these commodities. We produce a surplus of cotton, corn and tobacco above domestic demand, but also a major part of the world production. In these, therefore, we normally dominate the world market,[3] and income from their sales is dependent chiefly upon weather, blight, pests and stability of demand, together with such control as organization of producers may exercise upon acreage and marketing. The demand for the corn crop is tied up with the demand for hogs and cattle, and this indirectly subjects these branches of production to world market influences. In short, cotton and tobacco are practically the only surplus products in which our production exerts a dominant influence on the world market. In respect to dairy products the market is on the borderline between a domestic and a world basis; we produce a minor part of the world production and from time to time we have a surplus for

[1] The increasing foreign production of dairy products has made the domestic market, particularly in the East, more and more frequently subject to the price influence of the world supply in some lines.

[2] See p. 15. Excluding dairy products the percentage is 66%.

[3] With the increase in world production of cotton, however, the effectiveness of this control is diminishing. We now produce only slightly more than half the world output, and in some grades are large importers. In 1925 the United States produced 54% of the world supply. It has been suggested (New York *Daily News Record*) that England's efforts to increase cotton production in her territories may render her independent of the American supply by 1940.

export. But as regards wheat, hogs and cattle, or broadly speaking, grains and animal products, we produce a minor portion of the world output and, normally, more than we need.[1] It is thus clear that, under present conditions, at least 30% and often as much as 60% of the income from sales of American agricultural products is determined by conditions in the world market, as they are affected by world supply and demand, over which our producers have little or no influence.

If this portion of the agricultural income determined by foreign conditions were balanced with the domestic costs of production of these commodities there would be no difficulty in this situation. But there is little chance of our farmers competing in world markets with the newer exporting countries where production costs are lower. This portion of our production must therefore tend frequently to be sold at a loss or at no profit, unless domestic costs can be reduced or unless the domestic market can be improved by a reduction of domestic supply or increase of domestic demand, through restriction of acreage devoted to these crops, or increase of population, or by some artificial means. Various methods have been proposed in respect to the latter. They all involve essentially control of marketing of these products by co-operation or combination among producers, or by governmental agencies, together with tariff protection of the market against foreign competition. The discussion of the possibilities of controlling the influence of world market conditions in these branches of production, through organization of producers or governmental effort, is, however, beyond the scope of this report.

Domestic Market Influences

The latter factors, however, also influence the market for the remainder of our agricultural products of which we do not produce a surplus, and sales of which constitute about 40% of the agricultural income. In some of the less important of these, like sugar, wool and flax, we produce so much less than we need that we are large importers, and the tariff, as

[1] This is not uniformly true of cattle, nor of certain special kinds of wheat. Corn enters the picture chiefly in the form of hogs. The United States produces about one-third of the world production of wheat, rye, barley, oats and corn combined.

well as control of marketing by our producers, has or can have an important influence on income from sales.[1] As regards the remainder, such as dairy and poultry products, vegetables, fruits, and today to a certain extent beef, the organization and marketing methods of producers, the work of governmental agencies in disseminating market information, and transportation and marketing costs, are the chief factors affecting income from sales. These factors all affect the co-ordination of supply and demand and the spread between market prices and actual sales prices, and so influence the level and stability of the market income. Governmental agencies, by quick distribution of market information and by standardization of products, help to balance supply and demand and reduce marketing risks. The co-operative organization of producers of dairy products, fruits and vegetables, may stimulate demand by trade-marking and advertising, regularize marketing and reduce marketing costs.

During the past decade there has been an enormous development of marketing organization among producers, chiefly among producers of commodities dependent upon the domestic market. During 1924 it is estimated that the business transacted by co-operative farmers' organizations, including both selling and buying operations, amounted to $2,500 millions, approximately a fifth of the total agricultural business. Although 95% of these organizations are still local in the scope of their activities, approximately one-third of the total business is carried on by 100 of the federations and regional organizations. The average business of co-operative associations has more than doubled between 1913 and 1923, amounting in the latter year to $217,000 per association.[2]

Although the activities of these associations are diverse and continually expanding, their chief objective is to coordinate supply and demand in the various markets so as to

[1] As pointed out in Chapter II, p. 35, there has been a striking growth of imports of agricultural products directly or indirectly competitive with our own products, despite the rising tariff. In the five year period, 1920–25 our agricultural imports were equal to nearly 83% of our exports, and in 1925 over 50% or about $1,000 millions' worth of our total agricultural imports were competitive or alternative products.

[2] See Table 7, p. 21ff.

stabilize prices. This is attempted partly by increasing and stabilizing demand through advertising and trade-marking, but chiefly by control of the effective supply through regulating the marketing process. The problems here involved are complex and difficult, as the preceding discussion clearly indicates, but the development of co-operative organization represents an effort to meet them in ways adapted to the peculiar requirements of agriculture, just as the corporation, the bank and the trade association have developed to meet the requirements of business, industry and finance. Whether means will be found for making farm organization effective by preventing non-members from profiting by their work without bearing any of its cost; whether suitable legal safeguards both for members and others can be developed; whether, through extension internationally, they will be able to affect the market situation in respect to the great staple agricultural products in world trade; whether more complete organization of producers may not in time come into conflict with organizations of urban consumers of farm products, as has happened abroad—these are some of the important questions which the future must answer and which are beyond the scope of this study. But it is probable that the lack of effective organization of farmers before the war as compared both with their intensive organization abroad and the long and extensive development of industrial, financial and commercial organization in this country, has been one of the major factors in the unfavorable trend of the agricultural position since 1900.

Although transportation is usually considered a factor in the agricultural costs, it is rather to be looked upon as a factor affecting income from sales, since, however its costs are distributed as between the producer and the consumer, they are reflected along with all these other factors in the price the farmer receives, and cannot be distinguished from them. The market price of most agricultural products tends to fluctuate, under the influence of all the factors so far discussed, far more widely than the freight rate from the most distant point, and the total freight paid on agricultural products amounts probably to no more than 6% of the net value of the products sold, so that transportation costs can-

not be considered a dominant influence in agricultural income as a whole.[1] Their main effect is in creating wide differences in the net income of farmers in sections differently located in relation to the market, and in reducing or sometimes wiping out the margin between costs and prices when the latter are exceptionally low. In such periods the influence of transportation costs on the agricultural income as a whole may be very great.

Although, other things being equal, lower transportation costs for the industry as a whole tend to increase the total agricultural income, the significance of transportation in the agricultural income is positive rather than negative. Since only about 40% of the agricultural production is consumed on the farm while at least 60% must be sold in more or less distant markets, adequate and prompt transportation facilities are necessary to the realization of income from more than half the agricultural output, and their lack may be a far more important factor in income than their cost.

Prices

All these factors—domestic acreage and yield of the various crops, population changes, industrial development and activity, world supply and demand, market organization, tariffs and transportation—combine finally to make a price which the farmer receives, and this price for the amount of product he finally sells determines 80% of the agricultural income, as well as the money value of what he consumes. To them should be added the unmeasurable, but at times none the less significant, influence of the speculative activity of individuals and groups of buyers. While theoretically the produce exchanges serve to co-ordinate present and future supply and demand, at times they may increase rather than reduce the fluctuations of agricultural income.

Fluctuations and Spread

Considering the many influences which enter into these factors, it is to be expected that the outstanding characteris-

[1] See Bureau of Railway Economics, series of Bulletins on "Commodity Prices in Their Relation to Transportation Costs," Washington, D. C. See also page 127 of this volume for fuller discussion of this subject.

tics of agricultural prices and income should be their wide fluctuations. Not only are the fluctuations in the prices received by the farmer relatively much wider than those of non-agricultural products, but they have no regular relation to the fluctuations in wholesale prices, or to prices paid by the consumer.

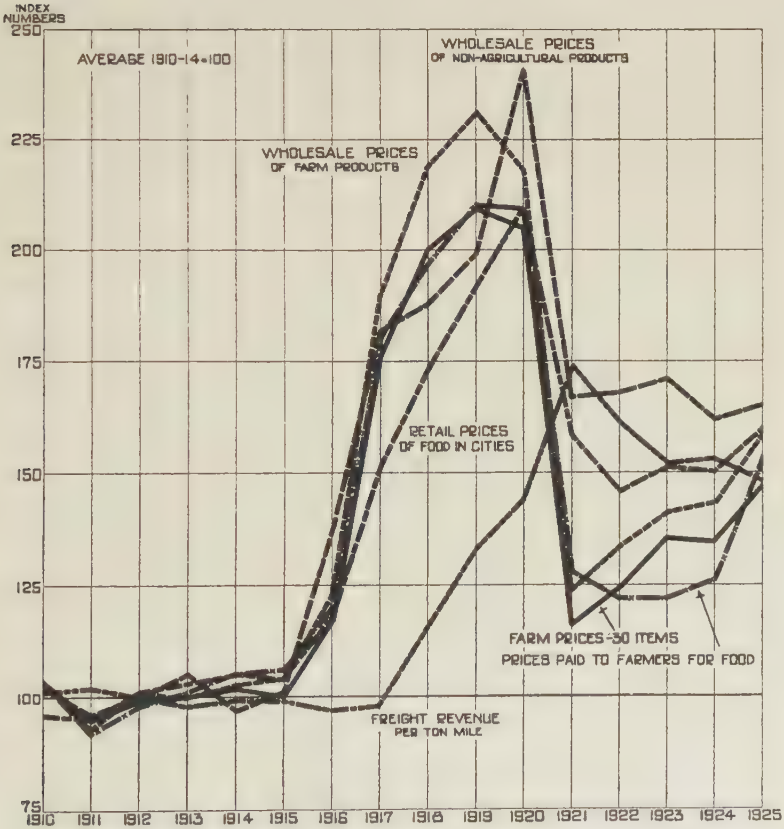
Chart 12 shows strikingly the wide changes in prices received by the farmer and their divergence from other price levels in the period since 1914. Wholesale prices of farm products, prices paid to farmers for farm products and for food, retail prices of food in cities and prices of non-agricultural products moved fairly closely together up to 1917 and then began to spread. This divergence in 1917, 1918 and 1919, however, was chiefly to the advantage of the farmer, and goes far to explain the favorable income situation in these years. But while, in the precipitous drop from 1920 to 1921, the various price levels slid down together, the depression left them wider apart than ever before, and in all cases to the disadvantage of the farmer. Since then, as the Chart suggests, there has been a tendency for the various price levels to draw together again.

The wide range of their fluctuations suggests that a considerable degree of stabilization and also of improvement is possible in the prices received by farmers without necessarily affecting wholesale or retail prices. It has been shown that the prices paid by consumers show such a wide spread from the prices paid to farmers that the fluctuations in the latter are not regularly reflected in the former.[1] This is doubtless due in part to the more effective organization of buyers than of sellers in the agricultural market. Although this situation confers no benefit on the consumer, it greatly affects the stability of the producer's income, because it prevents any flexible adjustment of demand to supply. If the consumer's price could adjust itself regularly to the changes in the producers' price, as the latter varied under changing supply, demand would tend so to vary as to steady the price level. The chief obstacles to such adjustment, however, are the

[1] For a detailed and comprehensive study of distribution costs see the report of the Joint Commission of Agricultural Inquiry, 66th Congress, Part IV, and Part I, Chapter 13.

fact that in most lines there are large seasonal stocks on hand, that demand for foodstuffs is relatively inelastic, and that distribution costs, dependent as they are on overhead charges and upon urban wages, are also relatively inflexible.

CHART 12: TREND OF FARM PRICES IN RELATION TO OTHER PRICES, 1910–1925



Sources: Prices received by farmers for 30 items, wholesale prices of farm products, wholesale prices of non-agricultural products, and retail prices of food in cities are from U. S. Department of Agriculture, *The Agricultural Situation*, February 1, 1926. The index of prices received by farmers for 30 items is on the basis of the average for the period August, 1909–July, 1914 = 100. Prices paid to farmers for food are from Warren and Pearson, "The Agricultural Situation," *op. cit.* p. 75, and from New York State College of Agriculture, *Farm Economics*, June, 1925. Freight revenues per ton mile are from U. S. Bureau of the Census, "Statistical Abstract of the United States," 1924.

Thus the burden of the instability due to changes in supply is thrown back chiefly upon the producer.

Changes in General Price Level

Underlying all these sources of the instability of agricultural prices, and therefore of agricultural income, are the forces which alter the general price level, or the value of the dollar. The changing value of the dollar, in such periods as the past ten years, is far more significant than all the other price influences combined; for, as has been seen, 80% of the agricultural income is measured in dollars, and however the intrinsic value of the farmers' product may be influenced by supply and demand, by marketing, tariffs, transportation or speculation, it ultimately depends on the result of translating it into dollars with which the farmer's expenses are paid.

Into the causes of periodic and long-time changes in the value of money it is not necessary to go; some of them, such as the influence of the gold supply, are "natural"; others, like fiscal and banking policies, are artificial or circumstantial. Whatever the causes, their significance for the economic position of agriculture is apparent. If the price level of agricultural products in any period, due to the causes discussed in the earlier part of this chapter, rises more slowly or falls faster than the general price level, agricultural income declines, even though the situation as to supply and demand and market conditions is unchanged. It is probable that, in the long run, the price level of farm products has tended to rise faster than the general price level, so that real agricultural income, in so far as it is affected by these changes, has tended to increase, and for similar reasons may be expected to do so in the future.[1] But at various periods the reverse has been true. The period since 1917 has been marked by extraordinary discrepancies between agricultural prices and general prices which partly account for the relative increase in agricultural income up to 1920, and the greater decline thereafter.

The changes in the value of the dollar affect agricultural income in still another way. This chapter is concerned only

[1] A. H. Hansen, "The Effect of Price Fluctuations on Agriculture," *Journal of Political Economy*, April, 1925, p. 196.

with agricultural income from production; but the agricultural investor, like others, also derives return from appreciation or undergoes loss from depreciation of the value of its capital—from increase in land values. The real value of land is determined partly by net income from agricultural production, and partly by other factors, including speculation, which need not be discussed here. But if the price of land, as fixed by these factors, rises more slowly than the general price level or falls more rapidly it is clear that farmers as investors suffer loss. In the long run, it is probable that, since land is a fixed natural resource, its value tends to rise faster than the general price level; but in periods of wide changes in the general price level the discrepancy between the movement of the general price level and that of land values tends seriously to disturb the position of those engaged in agriculture from the point of view of investment.

This results in two ways. When the general price level, including the price of farm products, rises rapidly the relative increase in the money income of farmers tends to be capitalized in advance in rising land values. Farmers buy additional land and go into debt on the chance of speculative gain. The increased land values and debts in turn involve higher fixed charges and so reduce income from production. When, then, the price level declines, the fixed charges become proportionately heavier. Either the net agricultural income from production is reduced, or the farmer must sacrifice part of the capital value of his investment, or both.

As Tables 14 and 16 show, the real value of all agricultural property decreased over 12% between 1912 and 1924–25, and the nominal value over 25% between 1919–20 and 1924–25. Despite this deflation the agricultural income was sufficient to pay only about a 4% return on the operators' investment. As Chart 8 shows, farm land investors by 1925 had lost about 18% of the pre-war exchange value of their properties. It may be, as is often suggested, that the capital investment in agriculture is still overvalued; but in any case it is clear that the wide change in the price level has caused an enormous loss either in income or in capital in the industry.

Instability of income from production or investment is, of course, not peculiar to agriculture. All industries share it;

but those which stand nearest natural resources or basic materials show it in largest degree and suffer more from it than the industries concerned with the last stages of manufacture or distribution. In their case, to the risk of fluctuating consumer demand, to which all production is subject,[1] is added the risk arising from uncontrollable production. The manufacturer can in a measure adjust his production quickly to fluctuating demand. Agriculture and even mining are not so flexible, since both involve natural processes. Moreover agriculture is a relatively unorganized, individualistic industry and therefore can exercise comparatively little concerted control over supply, demand or price. Broadly speaking, the crux of the difference between agriculture and manufacturing industry lies in the fact that in the former the output, determined by only gradually controllable factors and brought to market also under relatively slightly controllable conditions, determines the price, while in manufacturing the output and its marketing are quickly adjustable to the price. The farmer, like the manufacturer, might increase his income by a larger production even though prices were constant or falling. But in this, more than the manufacturer, he encounters not only an inelastic demand, but a tendency toward rapidly increasing costs.

The most important aspect of these changes in price levels, however, lies in their relation to changes in costs of production. For while the changes in the agricultural price level determine agricultural income, the changes in general price levels underlie agricultural costs, and it is the relation between the trend of income and that of cost that determines the economic position of agriculture. The factors and trend of costs will be discussed in the following chapter.

Summary

About 80% of the income of the agricultural industry is dependent upon the value of the product sold. This suffers from an unusually high degree of instability due partly to the inherent difficulties of co-ordinating production with

[1] It is worth while to emphasize again that agriculture is increasingly subject to fluctuating consumer demand as an increasing part of its products are used as industrial materials.

demand, and partly to circumstantial factors arising out of the marketing process, and to other influences affecting price levels. Among the most important of these circumstantial factors is the influence of seasonal, annual, periodic or local "surpluses" on the prices of products which determine the bulk of the agricultural income and which are sold on a world market basis, or subject to world prices fixed by foreign production costs. Other factors are the lack of effective organization of producers in marketing their products, the increasing organization of buyers, wastes in distribution, fluctuations of demand with changes in domestic and world industrial activity, and wide changes in general price levels due to fiscal and monetary influences.

There is an increasing tendency for the agricultural "plant" gradually to adjust itself more closely to demand, and it is probable that, although economic surpluses in particular periods and places will doubtless continue, persistent "surpluses" will tend to disappear. Great progress has been made in the readjustment of production in various branches of the industry and in special localities; agriculture is developing new forms of business organization and is being supplied with more prompt and effective information as to future market conditions; but there remain to be solved difficult problems involved in the marketing process and in the stabilization of price levels. In these respects the position of agriculture is still conspicuously weak in comparison with other industries. The imperative demand for its products which agriculture enjoys by reason of human need and expanding populations is likely, however, to compel solution of these problems and lead to improvement and stabilization of agricultural income, as better knowledge, intelligence and organization are applied to them.

CHAPTER IV

FACTORS IN AGRICULTURAL COSTS

Even though some of the factors described in the preceding chapter—land scarcity, increased demand from developing industry and growing population, improved marketing methods and perhaps more stable general price levels—may be expected to improve the sales position of agriculture in the domestic and world markets, the economic position of the industry obviously depends not only on its income from sales, but upon the exchange value or purchasing power of that income, which is determined by the cost of the goods and services, which farmers as citizens, workers, business men and investors have to buy. The significant thing in the position of agriculture is not only what its products are worth in terms of dollars, but what these dollars are worth in terms of the goods and services necessary to produce those products. While, as has been indicated, world conditions of agricultural supply and demand and of industrial development have played a leading rôle in agricultural income, domestic conditions have been the chief factor in agricultural expenses. What are the most important of these conditions and how have they influenced farm costs? In answering these questions it is first necessary to note some of the peculiarities of agricultural costs.

The Nature of Agricultural Costs

It is important to remember that, in respect to costs as in respect to income, the farm is not a factory. The costs of agricultural production are influenced by conditions peculiar to it.

In the first place, agriculture is a slow industry, subject to natural forces. The farmer cannot like the manufacturer adjust costs quickly, as, for example, by reducing labor supply and cutting operations. Less than half of the labor

element in production is hired. What the farmer does first to cut labor costs is to substitute his own labor and that of his family, and work harder and longer. Real labor costs on the farm therefore not only go on but really increase in unfavorable periods. Moreover, the turnover of capital is slow, requiring an average of six to eight years on the total capital investment for the industry as a whole. Fields cannot be left idle for as long as machines, for they grow up with brush. The livestock have to be fed, and the equipment kept up, although the return from them may be long in coming. Taxes and interest must be paid and the farmer's family fed and clothed, even though production is not profitable. Thus a large part of the costs of agricultural production are fixed costs.

Again, increased production per productive unit involves, beyond a certain point, increasing costs—more capital and more labor; while the manufacturer, subject to mechanical and not biological laws, has a much greater scope for the reduction of unit cost through the application of power and machinery. This, together with the fact that demand for agricultural products does not respond to lower prices as readily as does that for other goods and services, restrains the farmer from making up for a declining price by increasing output.

Finally, agriculture is not an incorporated industry. Thus the risk is not distributed, as it is in other business, and the burden of adjustment to increased costs by reduction of capital values and charges falls solely upon the producer and proprietor. In industry, trade and finance, money flows quickly and elastically to where profits are favorable. The investors are a large and constantly changing group. But about 60% of the farm property is owned by individual farmers; such property has not a quick sale, and the investor usually "holds on," despite losses, till the sheriff appears.

In the second place, it must be emphasized that agricultural costs are less flexible in relation to changes in income because, to a greater extent than is true in most other industries, they are joint costs. Although more specialized than it was formerly, agriculture is still a diversified industry. Each farm carries on several kinds of production at once. The

costs of one branch are largely inseparable from those of the rest, so that a restriction of production does not mean a proportionate reduction of costs. The costs of production can hardly be allocated to the different products; they must be taken as a whole and related to the income as a whole.

In the third place, it is necessary to note that in agriculture the costs of production and the living costs of producers are not so clearly separable as in industry. It has been seen that the agricultural income is a composite made up in part of the direct income of the farmer from the food and fuel he raises and consumes and from the home he occupies, the roads and bridges he uses, and the schools in which his children are educated, in part of his income as a worker and producer from the produce he sells, and in part of his return as an investor in real estate, from changes in the value of his property. Agricultural costs likewise are a composite of the farmers and his family's living costs as workers, his expenses as a citizen, his production costs as a producer, his marketing costs as a business man and his costs or losses in investment. So long as the American farmer, unlike the European, is so largely a proprietor, investing his savings in his farm, living on it with his family, working it chiefly by his own and his family's labor and deriving part of their living needs directly from it, it is impossible to separate these aspect of agricultural cost or to distinguish the conditions of expenditure which affect the position of farmers as individuals from those which affect agriculture as an industry. The cost of living of the farm family is as truly a production cost in the industry as are the wages of hired labor.

Distribution of Costs

The farmer, first of all, invests his savings in land, buildings, stock and equipment, pays interest on what he borrows and bears alone the depreciation costs on what he invests. Or he rents land, buildings and equipment from others, and pays cash or a share of his produce. Second, he pays taxes on personalty, on the real estate he owns, and on his income, all of which go to defray the costs of the services which he secures from the government in the form of roads, bridges,

schools, crop information and other ways. Third, he buys machinery, implements, drains, fencing, fertilizer, feed and seed, lumber, paint, cement and labor needed to produce his crops and to maintain the equipment and buildings required to produce them. Fourth, he pays a part of the freight and marketing charges on his produce sold. And finally, he buys food, clothing, electricity, telephone service, automobiles, gasoline, and sundries, not only for his family needs but to assist in his work and his business.

In view of the peculiarities of agriculture, as well as of the inadequacy of available data, it is impossible to draw up a balance sheet showing costs which will be comparable to that for any other industry. On the basis of authoritative estimates, however, the approximate amounts of the main items of expenditure outside the industry in the crop year 1924–25 may be arranged as follows:[1]

Item	*(Millions)*	*Per Cent of Total*
Food purchased	$1,600	16.4
Machinery, equipment, buildings and repairs[1]	1,500	15.4
Clothing purchased	1,400	14.3
Sundries purchased	1,250	12.8
Wages of hired labor	1,200	12.3
Rent paid to non-operators	1,050	10.7
Interest paid to non-operators	750	7.7
Taxes paid by operators	620	6.3
Fertilizer bought	300	3.1
Fuel and light purchased	100	1.0
	$9,770	100.0

[1] Including automobiles for business use.

Thus if, as in this table, the cost of producing the food and fuel consumed by the farm family and the crops fed to live-

[1] This calculation is based chiefly on estimates of the distribution of agricultural income for 1924–25 and on the returns of some 15,000 farm owner-operators published by the Department in *Crops and Markets*, Monthly Supplement, June, 1925, p. 179, and July, 1925, p. 236; also on estimates of expenditures on equipment, buildings and fertilizer for 1919–21 by the National Bureau of Economic Research, in "Income in the Various States," *op. cit.*, Chapter VIII. In addition the estimates by the Department, in the Report of the Secretary of Agriculture for 1925, of living costs of 3,000 farm families in different states have been used to approximate the expenditures for purchased food, fuel, light, clothing and sundries. Transportation and marketing costs, as well as the cost of the feed, seed, food and fuel supplied by the farm, have been deducted from the gross value of agricultural production, so that these figures represent the distribution of cash expenditures, except for such rent as is paid in crop shares. Figures have been rounded for simplicity.

There is a wide discrepancy between some of the data in these sources. The figure given by the Department for the value of products and services of other industries purchased in 1924–25 is much higher than that used here, and would not allow

stock be left out of consideration, the most important cash expenditures of the industry would appear to be those for purchased food, machinery, supplies, buildings, repairs and equipment, clothing, sundries (including housefurnishings and other articles of consumption), wages of hired labor and rent.

Variety of Influences on Costs

Not only does the relative importance of the items in combined agricultural living and business costs thus differ widely, but the prices or level of value of each kind of goods and services involved has changed and is changing a different way in relation to the price level which determines agricultural income. Each is influenced in the first instance by different economic forces. Agricultural wages are affected not only by the supply of farm labor, which depends upon, among other things, immigration, but by the demand, which depends largely upon farm prosperity, since when the cash income is unfavorable the farmer himself works harder, or longer, and drafts more of his family. If capital and other operating costs are favorable he may employ more machinery. The relative level of industrial activity and wages, too, has some influence, although probably not so much as agricultural conditions themselves.

Taxes are influenced chiefly by the extraordinary expenditures of war periods, by the demand for more extended or better community services, by governmental policies of taxation, borrowing and expenditure, and by the price level of the goods and labor which governmental authorities purchase in order to render their services. Rents of farm property are influenced by location, valuation, yield, and operating costs, that is by the trend of net agricultural income

sufficient net cash income to cover living expenses of farmers as measured by other estimates of the Department, if the latter's figures for taxes, interest, wages, etc., be accepted. Moreover, the figure in question is much higher than any that can be derived from other sources. Even on the basis of the figure here used ($1,500 millions) the total expenditures can be made to balance with the cash income only by allowing nothing for expenditures on education, health and advancement, which are included in the Department's estimates of living costs of farm families. In Table 16 the original figures of the Department for business expenditures were used, and this partly accounts for the discrepancy noted on p. 59 between the net cash income per farmer and the cost of the articles purchased by farm families for living purposes. The discrepancy is doubtless due to the fact already noted (p. 59), that the estimates of living expenditures are for a selected group rather than the average.

itself. Interest is affected not only by these same factors, but by the relative return of capital and opportunity for its employment in other fields, and by banking policies and credit facilities. The cost of fertilizer, machinery and tools, repairs, transportation, purchased food, fuel, clothing and sundries are determined by changes in the price level of these commodities and services. Here the general price level, the tariff, industrial wage levels and railroad conditions enter.

Thus the farmer's costs are determined by a complex of different factors, all chiefly national or local in their origin, while his market income is determined by influences of supply and demand, partly international in character, over which he has little control. This contrast constitutes the heart of the agricultural problem, and to secure a better picture of it, it is desirable to examine the principal items of cost separately and to note the discrepancies that have arisen in their relation to income. The items may be grouped according to their character and importance as follows: wages of hired labor, which form about one-eighth of the direct expenditures of the industry; taxes, rent and interest, which form about a quarter; fertilizer, machinery, tools, automobiles and buildings, 18%; food, fuel, clothing and sundry living expenses, the remainder.

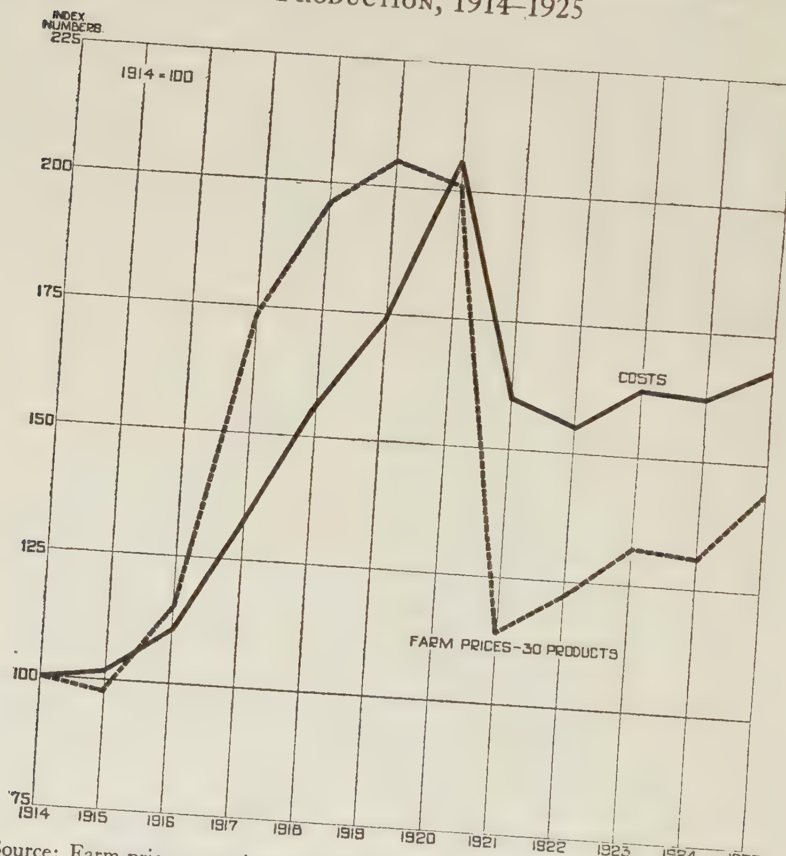
It is the change in these items of cost relative to agricultural income that determines the changes in the economic position of the agricultural industry and of farmers as a group. Chart 13 is an effort to show this relationship since 1914. Prices received by farmers for 30 representative farm products, weighted in proportion to the average amount sold in the period 1918–23, are taken as an index of agricultural income. This is compared with an index of costs made up of farm wage rates; interest and taxes per $1,000 of property value; retail prices of food, clothing, fuel and light and sundries; retail prices of fertilizer, farm machinery;[1] and building costs, each weighted according to the relative expenditures for them in 1919.

This chart shows clearly the inelasticity of agricultural costs in relation to prices received for farm products. From 1916 to 1919 farm prices rose more rapidly than costs, which

[1] Exclusive of automobiles.

accounts for the favorable showing of agricultural income from 1917 to 1919. The decline in costs, however, was less

CHART 13: CHANGES IN PRICES PAID TO FARMERS AND COMBINED ELEMENTS OF COST OF AGRICULTURAL PRODUCTION, 1914–1925



Source: Farm prices are prices received by farmers for 30 representative products. Costs are a composite of rates of farm wages, property taxes and interest per $1000 of property value, prices of fertilizer and farm implements, building costs and cost of living of farm families, weighted according to their relative importance in 1919. See Table C, Appendix, p. 157, for details.

rapid and smaller than in prices, leaving a gap in each year since 1921 wider than in the favorable years, and slow in closing.

Farm Wages

Although about three-fourths of the labor of agriculture is normally done by the farmer and his family, the wages of hired labor are an important factor in the economic position of agriculture for several reasons. On the one hand is the fact that wages form about 12% of the farmer's cash expenditures and are an item which tends to be reduced first in any retrenchment of expenditures. On the other hand is the fact that about 40% of the persons engaged in agriculture are wage laborers without tenure. If farm wages are low in comparison with other wages and the general labor supply is limited, labor tends to flow away from the farm to the city. The farmer's costs are increased, and he has the alternative of working harder himself, with his family, or of making wider use of machinery, if other factors of cost permit. The competition of industry for labor, the restriction of immigration, and resultant high farm wages may therefore in the long run benefit agriculture; but the immediate effect is to reduce the supply of cheap farm labor and make farming more costly and harder. In general the tendency in agriculture has been to reduce the employment of hired labor to the minimum and to substitute more family labor and machinery. There is some reflection of this in the fact that whereas hired farm laborers constituted 47.7% of the persons occupied in agriculture in 1880, the percentage had declined to 39.4% in 1920.[1]

Farm wages are influenced on the one side by agricultural prices and on the other by industrial wages. Near industrial centers, and when manufacturing industry is active, they tend to vary with industrial wage levels. Farther from cities, they are affected chiefly by the extent to which the farmer can afford to use labor and by what he can afford to pay for it—that is, by the level of income, in which farm prices and other farm costs are the chief factors. Farm wages, moreover, like all other aspects of the farm industry, are influenced by factors peculiar to the agricultural group. Nearly 50% of the farm laborers work on the home farm. There is thus a special relationship to the employer and the

[1] U. S. Department of Agriculture, Yearbook, 1923, p. 511.

job which makes the farm laborer more aware than the industrial worker of the position of the employer, and more willing to accept reductions in wages and remain with the employer.[1] For these and other reasons farm wages respond to price changes more quickly than do industrial wages, as may be seen in Chart 14.

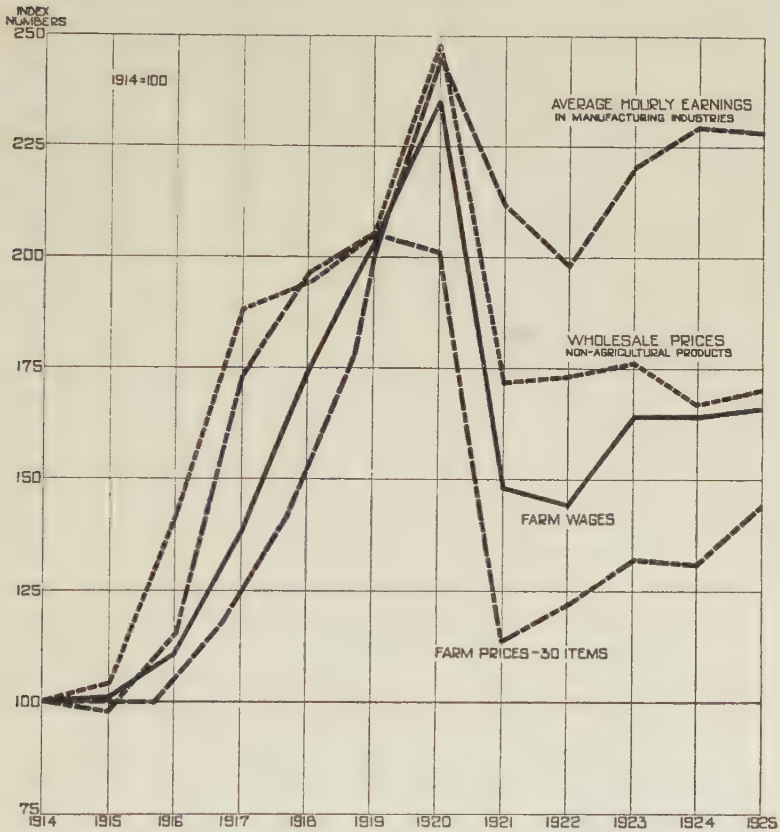
In respect to farm wages the chart indicates that during the war period wages lagged behind prices, but did not fall to such an extent afterward. Since 1919 wages have remained considerably above the price level and have tended to rise almost as rapidly as farm prices since 1922. In 1925 the index of farm wages was 166, while the index of prices paid to farmers was 144, both as compared with the average for 1914 as 100. The balance between the wage cost and prices is thus far from being restored, and new factors are tending to affect the readjustment. On the one hand, the sustained high levels of industrial wages and the restriction of immigration, which cut the net immigration of farm laborers in 1924–1925 to approximately half that of the preceding year, may serve to keep farm wages high. On the other hand, these factors may stimulate the substitution of machinery, and so reduce the amount of direct labor cost.

It is important in this connection to note the rapid increase in the use of power and mechanical equipment in American agriculture and its bearing on costs of production. It has been estimated[2] that labor and power together (including the value of family and hired labor and animal labor with that of mechanical power) represent on the average 60% of the cost of production in American agriculture. Our agriculture is probably the most highly mechanized in the world. About 16 billion horsepower hours are utilized

[1] The "casual laborer" who has been so important in the wheat, fruit and lumber sections of the West is, of course, quite different in this respect; but he represents a problem which is not solely agricultural—that of seasonal employment. It is worth noting that, if agriculture should become more largely organized on a business basis, under corporate ownership, agricultural labor would take on more of the character of industrial labor and the wage problem would be far more important. Moreover, in agriculture the costs of supervision tend to increase and the efficiency per man to decrease in proportion to the size of plant more rapidly than in the case of manufacturing industry. These are some of the reasons why corporate agriculture, on the basis of hired labor, is generally unprofitable.

[2] Data in this paragraph, except as otherwise noted, are from C. D. Kinsman, "An Appraisal of Power used on Farms in the United States," U. S. Department of Agriculture, Bulletin No. 1348, July, 1925.

CHART 14: CHANGES IN WAGES AND PRICES, AGRICULTURE AND MANUFACTURING INDUSTRIES, 1914–1925



Sources: Average hourly earnings in manufacturing industries are from National Industrial Conference Board. Farm wages are represented by a composite index of wages per month, with and without board, weighted according to the prevalence of the various types of payment, from U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, February, 1926. Wholesale prices of non-agricultural products and prices paid to farmers are from U. S. Department of Agriculture, *The Agricultural Situation*, February 1, 1926.

annually, of which mechanical power constitutes nearly 40%.[1] The total cost of this power is about 19 cents per horsepower hour or close to $3 billions annually. About 80% of this power is used directly in the production and marketing of

[1] Electric power formed 5½% of the total used.

crops.[1] The primary power available in agriculture is more than the primary horsepower in manufacturing and mining combined, and is second only to that of railroads. In 1850 about 6 million horsepower were available on American farms, this being wholly horses, mules and oxen. In 1924 about 47,420,000 horsepower were available, of which nearly 60% was mechanical. This change has made possible the large increase in production per worker which has taken place during this period, and which makes our farmers the most efficient in the world.[2] Since 1850 the number of horsepower per worker engaged in agriculture has nearly doubled, and the amount of machinery per worker has increased nearly ten times.[3] In consequence the agricultural worker can care for nearly twice as many acres of improved land as he could 75 years ago. It is estimated that in this way about eighteen million persons otherwise necessary for our present agricultural production have been released, or a number equivalent to nearly two-thirds of the gainfully occupied in non-agricultural pursuits.

It is likely that, with the increasing availability of cheap electric and gasoline power, this development will continue. But the economic practicability of extended substitution of mechanical power for human labor in agriculture is affected by considerations different from those that apply in industry. Efficient use of power requires concentrated and continuous application of it to materials. Continuous application is more difficult in an industry regulated by natural forces, subject to seasonal conditions and characterized by such a wide variety of operations. Power machinery, moreover, is not easy to use economically on small farm units. The investment and overhead costs involved in the use of mechanical equipment are important factors affecting the greater utilization of power, and these depend upon other conditions affecting income and costs. The inelasticity of demand, high taxes, interest and land values all render the

[1] About 48% is used for field work and 22% for hauling.

[2] The U. S. Department of Agriculture (Press release, June 5, 1924) estimates that the production of crops per worker in the five-year period 1910–14 was 159% greater in the United States than in England, Germany, France and Belgium.

[3] The number of tractors on farms in 1925 was 506,745, an increase of 105.9% since 1920 alone.

problem of further reduction of unit costs through greater mechanization far from simple. But rapid progress is being made in the improvement of farm machinery and in the adaptation of machinery and power to the peculiar needs of the farm industry. This development is of the utmost significance for the future of American agriculture. Although our agriculture is highly mechanized and the American farmer is the most efficient in production in the world, his competitive power in world markets is still weak, while the use of machinery by foreign producers is rapidly increasing.

Fixed Charges

Taxes, interest and rent are grouped together because they stand in a special relation to farm costs and income. They are fixed charges affected by a different set of conditions from those which influence other elements of expenditure.

Taxes

The importance of the tax burden in the economic position of the agricultural industry is but inadequately represented by the general figures already given. The taxes paid on operator-owned investment formed in 1924–25 only about 6% of the cash expenditures of the industry, and amounted to about $617 millions. But this does not indicate the full burden upon agriculture, since a large part of the rent paid on property rented from non-operators goes to pay the taxes on this property. To this should be added income and indirect taxes paid to local, state and federal governments by the agricultural community. On this basis it is estimated that the taxes paid by the industry amounted in 1922, the last year for which comprehensive data have been assembled, to $1,436 millions. This was equivalent to about 13% of the agricultural gross income for that year.[1] In 1924–25 the total property taxes borne by the industry are estimated at $891 millions.[2]

Taking only the taxes paid by operator-owners on their investment in 1924–25, $617 millions, involving a payment

[1] National Industrial Conference Board, "Tax Burdens and Exemptions," Research Report No. 64, 1923, pp. 29, 32. See also Table 16.

[2] See p. 57.

of about $160 per owner-operator, calculations based on Table 16 indicate that the average tax burden was about 27% of the net cash income after payment of all other expenses.

However the amount and importance of the tax burden on agriculture is presented, the significance of the changes that have taken place in it in relation to agricultural income is clear. Thus the figures given above for direct taxes paid by operator-owners show a steady rise in amount since 1919, while the agricultural income has dropped enormously. Going further back it is seen that while the total taxes, direct and indirect, paid by farmers and farm property owners in 1913 were $624 millions, in 1922 they had risen 133% to $1,436 millions.[1] Direct taxes on farm property averaged $265 millions in the period 1909–14 and $891 millions in 1924–25, an increase of nearly 236%, while the gross agricultural income increased only about 100% in this period, as shown in Chart 15.

The relationship of general property tax rates to the prices received by farmers is shown in Table C.[2] This indicates clearly the importance in the agricultural situation of changes in the tax burden. While farm wages fell more or less with farm prices, taxes in relation to the value of farm property have risen since the agricultural price decline, and remain on a higher level than any other item of expenditure, 112% above the 1914 level.

Two peculiarities of the agricultural industry render this situation of special significance. One is the basic fact, already stressed, that in the agricultural industry the output and the marketing of the product determine the price. Since both these factors are relatively little controllable by the agricultural producer, he is in no position to shift any part of his tax burden to the consumer, but must pay it out of his cash income, on which it is a prior lien.[3] On the other hand, the manufacturer, from whom the farmer buys commodities and services which represent 60% of his living and business expenses, is often, though not always, in a position to trans-

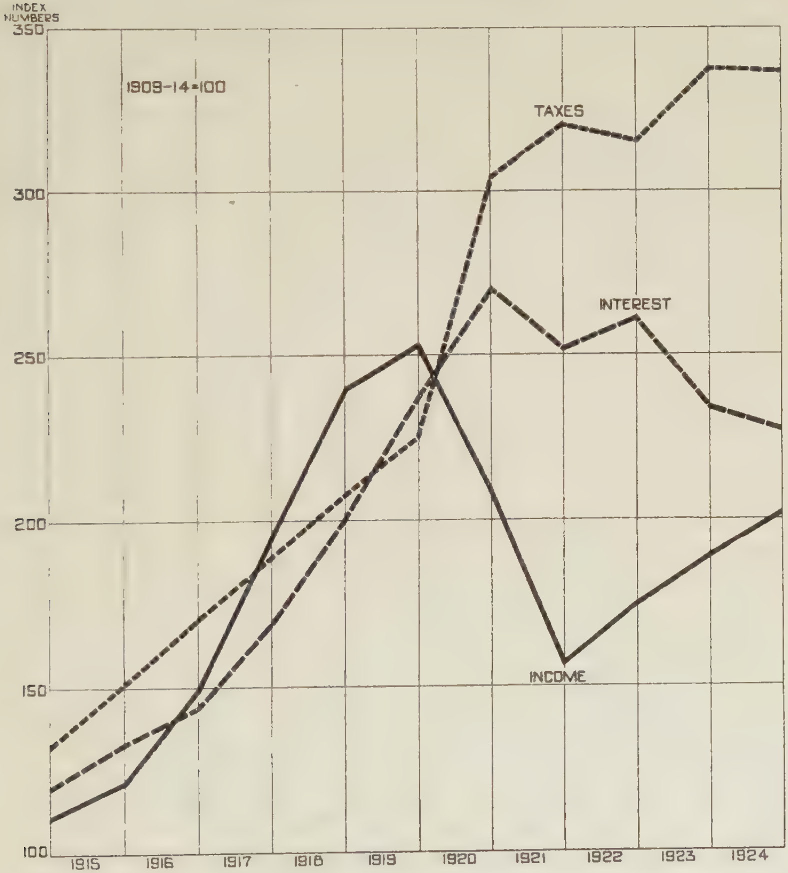
[1] "Tax Burden and Exemptions," *op. cit.*

[2] Appendix, p. 157.

[3] In the long run, of course, there is some measure of shifting to other groups as prices of agricultural products rise with the contraction of the industry under unfavorable conditions.

late his tax burden into the price to the consumer because he can adjust his output to the price and reduce his other costs of production. Thus the farmer is compelled to bear

CHART 15: CHANGES IN TAXES, INTEREST AND INCOME IN AGRICULTURE, 1909–1925



Source: All data are for fiscal years. Data on income include the value of food, fuel and rent supplied by the form and are based on Tables 15 and 16. Taxes represent general property taxes on all farm property. Interest includes interest on mortgage and bank indebtedness. Data on taxes and interest for fiscal years from 1909 to 1918 inclusive are from L. M. Graves, "Interest and Taxes in Relation to Farm Income," *Annals of the American Academy*, January, 1925, p. 37; for fiscal years 1919 to 1924 they are from U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, July, 1925.

his own tax burden as a seller and a part of other tax burdens as a buyer.

A second and equally important peculiarity of the position of agriculture is that its tax burden, unlike that of other classes, is fixed with little relation to the agricultural income. The significance of this feature of agricultural taxation will be apparent if its character is examined in some detail.

Farm taxation is peculiarly a state and local problem. The American farmer is only lightly affected by direct federal taxation, although his burden of indirect federal taxation under the revenue laws of recent years has probably been relatively somewhat higher than for some other important economic groups. While the agricultural industry has contributed, as an average, about 15% to the national income in recent years, its share in the total income reported for federal income tax purposes has been approximately one per cent. Furthermore, the preponderance of this income so reported has been subjected to no federal income tax whatever because it has been within the personal exemptions allowed by the law. On the other hand, some of the indirect federal taxes, such as the excise tax on automobiles, trucks, tires, and accessories, may have been a greater burden upon agriculture as a business than upon other important industries, because of the relatively low money income of farmers and their relatively low return on investment.

State and local tax burdens upon agriculture, however, have risen rapidly in recent years. The principal source of state and local revenue is the general property tax, which, as its name implies, is supposed to reach the capital value of all property. So long as economic life was simple and agriculture dominated the national economy, the general property tax could be enforced with little or no inequity resulting therefrom, but as industry and trade began to develop and property became more and more differentiated, the general property tax was gradually transformed into an impost which rested almost exclusively on real estate. Intangible personal property, such as stocks, bonds, bank deposits, notes, etc., grew by leaps and bounds until it now exceeds in all probability the value of real estate, since it represents not only evidence of ownership in land but also

the capitalized value of franchises, rights, good will, patents, potential earning power, etc. It has been increasingly difficult to reach this increased wealth by taxation. The majority of communities are therefore confronted with decreasing assessments of intangible personality in the face of continued growth and expansion in this class of property, and in two states it has been abandoned. The ultimate result of this tendency has been to place the bulk of the burden of local government support and an appreciable portion of state government costs on real estate alone. The farmer has suffered particularly from this development, since virtually all his property is of a conspicuous form and cannot escape the eye of the tax assessor. In 29 states over 50% of the state revenues are still derived from general property taxes, and in nearly all the important agricultural states the percentage of revenues so derived is over 60%.[1]

For the country as a whole, the amount of taxes levied upon farmers under the general property tax system grew steadily from $308 millions in 1913 to $746 millions in 1921, $799 millions in 1922 and $845 millions in 1923. The increase in general property taxes on agricultural wealth during the ten-year period was thus 174%. The increase in general property taxes upon all other forms of wealth during the same period was 217%, but the latter percentage should be taken as a minimum, since the general property tax system has disintegrated and has been resolved in some cases into separate forms of taxation, some of which no longer have capital value as their basis. Intangible personal property is in some instances now reached by an income tax, and exempted from the general property tax, and the same policy is being pursued in respect to tangible personal property of business enterprises, as, for example, in New York State. While these internal changes in the general property tax system and the substitution of other taxes have affected agriculture but little, the strict comparison between tax burdens on agriculture and on other industries is nevertheless thereby weakened.

On the other hand, while a glance at the percentages of increase in general property taxation for state and local

[1] See U. S. Department of Agriculture, Yearbook, 1924, p. 282.

purposes would appear to indicate a favorable comparison as far as agriculture is concerned, there are other factors to be considered. If cognizance is taken of the relatively low and uncertain return on investment which agriculture yields to its owners, as has been demonstrated elsewhere, and if sufficient emphasis is placed on two additional factors, namely, the comparatively small cash incomes which farmers enjoy, and the tendency to make too large an allowance for anticipated future earnings and thus exaggerate the value of farm lands, the significance of the disparity in rate of increase in general property tax burdens as between agriculture and other property is considerably diminished, since in the ultimate analysis it is realized income that determines tax-paying capacity. Furthermore, from the available census data it appears that the growth in capital value of farm property has been less appreciable than that in other forms of wealth.[1] Reliable but admittedly incomplete official data indicate that the true value of agricultural property has risen at most only one-half as rapidly as urban property values. This circumstance would explain the larger increase in the tax burden on the latter groups under the general property tax system, which is predicated on capital value. Finally, differences in the quality and quantity of services received from government in return for tax monies paid into public treasuries must be carefully weighed before conclusion can be reached as to the relative weight of tax burdens. On the one hand, the increasing expenditures of government on behalf of agriculture must be taken into account. On the other hand, it is a question whether rural communities have obtained the same kind or amount of public benefits as urban districts in respect of education, street paving, policy and fire protection, road lighting, health and sanitation measures and in countless other ways, although the differences today are less material than five or six decades ago, partly as a result of federal and state aid from taxes collected from non-agricultural classes.

If due consideration is given to all these factors, there can be little doubt that the burden of taxation, as related to tax-paying capacity and with recognition of the comparative

[1] See Table 14.

quid pro quo obtained, is heavier on agriculture than upon the rest of the nation's taxpayers combined, although there may be found individual instances of excessive taxation within the non-agricultural groups. An investigation of the United States Department of Agriculture,[1] covering selected farm lands in three representative counties in Indiana over a period of five years, namely, 1919–1923, disclosed the startling fact that general property taxes consumed approximately one-half of the net rent[2] in 1922 and over one-third in 1923, having steadily increased from one-eighth of the net rent in 1919. The average burden for the five years was 32.9% of the net rent. On the other hand, selected urban real estate (both business and residential) in the county seats in these same areas was taxed on average of 28.5% of its net rent over this five-year period; but on the basis of comparable benefits and services received from the expenditure of tax monies (i. e., eliminating the cost of city government which the farmer neither receives nor enjoys), the general property tax paid on urban real estate averaged only 16.0% of the net rent. Thus the burden of the general property tax on agricultural land was almost twice as heavy as on city and town realty. How far this comparative picture applies to the country as a whole cannot be definitely stated, but such data as have been collected in various studies by governmental and private agencies appear to indicate that the situation in Indiana is fairly typical of other important agricultural localities. In Ohio, for example, taxes on selected cash rented farms, expressed as a proportion of net rents, rose from 23.8% in 1913 to 31.1% in 1919, 34.0% in 1920, 37.8% in 1921, and 41.0% in 1922.[3]

What are the principal causes of this state of affairs? What factors are chiefly responsible for the burdensomeness of taxation as affecting American agriculture? What are the remedies to be sought? Is increased taxation merely an aftermath of the World War, transient in its duration, or is it likely to be a relatively permanent phenomenon?

[1] "Taxation of Farm Real Estate in Indiana," March, 1925.

[2] "Rent" is here used in an economic, not a popular sense, as the net income after current expenses and other fixed charges are paid.

[3] U. S. Department of Agriculture, Yearbook, 1924, p. 268.

Answering the last question first, it may be safely asserted that the tendency of democracies has been and will probably be in the future in the direction of enhanced public expenditure. An ever-increasing proportion of society's wants and needs is being satisfied by government. This circumstance is merely a different way of stating that taxation is bound to continue its upward course. The principal danger in this situation is that civic indifference, extravagance and waste may grow hand in hand with the increasing volume of public expenditure, in view of the proverbial inefficiency of democracies. In the measure that these factors operate, the burden upon agriculture in the form of general property tax, which is the mainstay of state and local finance, will be correspondingly enhanced, with no real or lasting benefit to the state at large or to rural communities therein concerned.

The principal objects of local government expenditure on current account are debt charges, education and highways. Increased debt charges of recent years have been, however, in themselves merely the reflection of capital outlays on account of education and highways, and it is therefore not incorrect to assert that the latter two items constitute the chief concern of local public finance.

Although these functions are essentially of a state-wide and national character, the burden of financing them is placed on the local unit, with consequent distress to the agricultural districts. While it is being increasingly recognized that an adequate and systematic education is a right which every child, wherever he chances to be located, may demand from government, and while strict supervision and control over the educational offering of local school authorities is being progressively lodged with a central body created by the state, the problem of defraying the cost of maintaining these higher standards is still left largely with the local school districts to cope with, irrespective of whether or not they have the resources to finance the required educational program. More or less the same conclusion obtains with respect to road construction and maintenance. A large portion of the mileage constructed by counties and towns is primarily for general rather than local use; yet the cost has to be met wholly or predominantly by the local taxing unit. State aids

and subsidies are being granted in larger and larger measure but in an uncertain and haphazard manner. They have not, however, reached the point, by and large, where the relief from the support of these activities by agricultural communities has satisfied the full demands of an equitable distribution of the tax burden. Until the various state governments wipe out arbitrary and unwarranted distinctions between general and local benefits and adopt a broad, social viewpoint, the solution of the burning question of taxation as it affects the agricultural industry will be retarded.

It is significant to note that the alarming increase in the general property tax levy observable in recent years has been arrested in some of the principal agricultural states. In the past two years the levies have in some cases been either stationary or have declined somewhat, and in other cases where slight increases have been registered in the total, the gain has been wholly in the larger urban districts. In 1924 decreases in general property tax levies for local government purposes were noted in Iowa, Minnesota, Montana, North and South Dakota.[1] Although the percentage of reduction in these cases was relatively small, it may indicate the beginning of a downward trend.

The rise in the tax burden is, of course, partly a reflection of changes in the general price level, or what is the same thing, in the value of the dollar with which the taxes are paid. Taxes, however, reflect not only increased costs of goods and services for which they are expended by governments, but the revenue and expenditure policies of governments. The tremendous increase in state and local indebtedness in recent years is particularly significant in this connection. Wars, embarkation upon public improvements, extension of governmental services all imply not only immediately increased taxes, but, to the extent that these expenditures are defrayed by borrowing, they imply higher levels of taxation for long periods ahead. For this reason taxes fall more slowly than they rise. When, in addition, the general price level falls, that is, when the value of the taxpayer's dollar increases, while the level of taxes remains high or falls more

[1] See National Industrial Conference Board, "The Cost of Government in the United States," New York, 1926.

slowly, it is clear that the *actual* burden of taxation increases. That is why the item of taxes assumes such a special significance in relation to the economic position of agriculture. Even though the prices of other things which the farmer buys may fall, such a decline only serves to increase the actual burden of taxation unless taxes fall as much, because the agricultural taxpayer's dollar becomes worth so much more to him.

Interest

The considerations just outlined are important in relation not only to taxes but to all fixed charges, and especially in relation to interest. Taxes represent in large part fixed charges on agriculture arising out of debts contracted for governmental services. Interest is a fixed charge arising out of the debts of the farmer. The burden of these debts and fixed charges rises when prices rise, but it falls much more slowly than prices, for a number of reasons which operate together.

Land values and the interest charge increase as the value of the dollar falls and as rising prices give prospect of increasing returns to agricultural investment. The high demand for capital in other industries tends to increase interest rates. Many hired men become tenants and tenants buy farms and go into debt. Usually the increase in the value of land capitalizes in advance the increasing return and mortgage debts and interest charges tend to increase more rapidly than the return. Then, when prices fall, agricultural income is reduced, and as the dollar increases in value the real burden of fixed interest charges on debts becomes heavier, unless either the rate is readjusted or the debts diminish. Since interest rates change little, what happens in practice is that land values drop, the debts are liquidated by force, and the farmers' equity is squeezed out. While it is true that a part of this loss to agriculture may be considered a speculative loss falling upon the farmer in his rôle as an investor, it would appear quite unfair, as is often done, to dimiss it with the comment that the farmer should stick to his business and not try to combine real estate speculation with farming. Other fields of economic activity are not so free of the specu-

lative element as to justify discharging a hail of critical cobblestones at the farmer; and, moreover, other groups outside the agricultural class play a large part in the speculative booming of land values in some farming districts. In any case, as has been pointed out, it appears that the capital value of farm property as a whole has probably not increased as rapidly as the capital in other property and has suffered a more drastic deflation since 1920.[1]

The farm debt problem began to show itself significantly after 1910, but its effects have become most acute since 1920. Data are not available by which to show conclusively the trend of total farm indebtedness in recent decades, but the following are sufficient to indicate the seriousness of the question.

Table C[2] indicates that between 1914 and 1925 the interest burden in relation to the value of farm property had risen 54%.

The Census data on the mortgage indebtedness of farms operated by owners indicates that from 1890 to 1910 the debt burden probably did not increase faster than the value of farm property. The proportion of owner-operated farms mortgaged increased steadily from 27.8% in 1890 to 37.2% in 1920, suggesting that a relatively increasing number of farm-owners were going into debt during this period. But whereas in 1890 the amount of the debt of owner-operated farms was 35.5% of the value of the farm land and buildings mortgaged, in 1910 it had fallen to 27.3% of the value. This also was the percentage of the mortgage debt to the value of *all* mortgaged farm land and buildings in 1910, according to separate studies of the Census Bureau covering tenant operated farms. In the years from 1910 to 1920, however, the percentage of mortgaged indebtedness to the value of all mortgaged farm land and buildings, as estimated by the Census Bureau, had risen to 29%, and the total mortgage debt is estimated at $7,857 millions in 1920.

On the basis of the Census figures it is found that while the value of farm land and buildings increased 90.6% between 1910 and 1920, the total mortgage debt increased 147.7%, that on owner operated farms, 128.4%, and that on tenant farms, 217.1%, for the United States as a whole. In some

[1] See Table 14. [2] See p. 157.

sections the increase was more remarkable, as may be seen from the following table:[1]

Section	Per Cent Increase in Value	Per Cent Increase in Total Mortgage	Per Cent Increase in Owner Mortgage	Per Cent Increase in Tenant Mortgage
United States	90.6	147.7	128.4	217.1
West North Central	110.7	160.3	128.8	258.7
South Atlantic	109.2	174.3	154.1	229.8
East South Central	110.8	199.7	172.9	266.9
West South Central	101.1	162.3	146.3	194.8
Mountain	139.7	489.4	448.6	858.7

Correcting the Census values of mortgaged farm land and buildings by an allowance for depreciation of 25% since 1920, as indicated by preliminary figures from the farm Census of 1925, and assuming the same mortgage debt as in 1920, $7,857 millions, it is estimated that in 1925 the mortgage debt on all mortgaged farm land and buildings would probably amount to 38.8% of the total value.[2] Other estimates place the total mortgage debt on all farm property as high as $8,500 millions, which would be nearly 42% of the value of mortgaged property.[3]

Farm mortgage debts are of long duration, requiring often a lifetime for liquidation. Only 10% of the farm operators under 25 years are owners free from mortgage, and of farmers 65 years of age no more than 64% are owners free from mortgage debt. Thus despite the rise and fall of prices, diminishing or increasing the value of the dollar, the dollar debts and debt charges remain. With the slow turnover of capital invested in agriculture, requiring six to eight years on the average for the entire United States, and the small cash accumulation characteristic of the industry, it is obviously more difficult for the farmer to adjust himself to inflation and deflation. These peculiarities of agriculture are emphasized by the fact that it is not as yet to any great extent an incorporated industry, but a personal one, and adjustments of capital and capital charges are less easily made. In other industry or business, when earning capacity

[1] Cited in A. M. Loomis, "The Trend in Tenancy and Ownership," *Annals of the American Academy*, Jan., 1925, p. 67.

[2] This ratio of mortgage debt is indicated also in the preliminary figures from the Census of Agriculture of 1925 for a few states.

[3] L. M. Graves, "Interest and Taxes in Relation to Farm Income," *Annals of the American Academy*, January, 1925, p. 37.

declines, capitalization can be reorganized, and the loss distributed over thousands of shareholders, who are a constantly changing group. In agriculture such "reorganization" means that the farmer loses his farm or sacrifices his equity, as happened in the years since 1920.

These considerations apply not only to the mortgage debt, but to the personal indebtedness of farmers, which has been an increasingly important factor in agricultural costs. It is estimated that the personal indebtedness of farmers has risen from about $1,000 millions in 1909–1910 to $3,250 in 1924–25, on which the interest charge has grown from $70 millions to $211 millions.[1] To this should be added, if data were available, the indebtedness for merchandise, implements and automobiles, not estimable in amount, but reflected in higher operating and living expenses.[2]

In the crop year 1919–1920 the Department of Agriculture estimated the total indebtedness (mortgage and personal) of all farms and operators at $12,250 millions, and the total value of the capital invested (land, buildings, equipment, stock, etc.), at $79,607 millions. The indebtedness was thus 15.4% of the total value, and required a payment of $788 millions or 5% of the gross income. In 1924–25 the value of the capital invested in agriculture had fallen to $59,154 millions, while the indebtedness was unchanged. The total indebtedness thus rose from 15.4% of the total value in 1920 to 20.7% in 1925. While the actual interest charge changed little, the farm income declined, so that the percentage of income required for interest rose from 5% to 6.2% of the total. The interest charge upon the operator's debt not only required 1.2% more of the gross income, but his equity declined from $47 billions to $32 billions, a loss of about $15 billions or nearly a third of his investment in five years, while the owners of rented farms appear to have lost $5¾ billions of the equity in their property.[3]

[1] L. M. Graves, *op. cit.*, p. 37. These figures include only bank indebtedness.

[2] Comparing the figures for mortgage and bank indebtedness given by Graves, *op. cit.*, with those for the total indebtedness of farmers given by U. S. Department of Agriculture, *Crops and Markets*, July, 1925, the miscellaneous indebtedness of farm operators may be estimated at $500 millions.

[3] U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, July, 1925.

Taking the total interest on indebtedness in 1924–25 as $753 millions, the interest payment per owner-operator was $197. This, according to calculations based on Table 16, was over 30% of the net cash income after payment of other expenses.

In such a situation it is clear that flexibility of credit and interest rates would be of the greatest importance to the farmer as an investor and business man. Yet in these respects it would appear that until recent years the farmer has been at a disadvantage as compared with other lines of business. Interest rates for farm loans vary little. The adjustments to changing conditions have been made, as has been indicated, chiefly at the expense of the farmer's equity.

Although, through the federal farm loan banks and the intermediate credit banks, as well as other agencies, general credit conditions in agriculture have been greatly improved, there is some indication that the farmer does not receive or avail himself of the cheapest and soundest forms of credit now obtainable. In particular the development of co-operative credit organization in this country has been backward as compared with that in European countries. Great progress, however, has been made in the extension of credit facilities in agriculture and their adaptation to the peculiar needs of the industry, although there remain some important gaps in the credit system still to be filled.

Rent

Rent is to be considered with taxes and interest because it is so greatly influenced by changes in these items of cost. Rents reflect what the owner has to pay in taxes and interest and what he expects to get as a return on his own investment. It is true that they are influenced somewhat by changes in the agricultural income, but debts and taxes of the owner of rented land are the major influences, and rents therefore do not follow elastically changes in the prices of agricultural products. They thus add to the maladjustment between income and fixed charges which is the feature of the tax and debt situation in agriculture.

The importance of this item is reflected in the fact that nearly half of the farmers are tenants or rent land in addition

to what they own. This group is, however, better situated to adjust itself to changes in agricultural prices in that its tenure is flexible and also because a large part of the rent is paid in shares of produce, in which case the landlord suffers or profits more or less with the tenant. Among other factors which have stimulated it, this advantage of flexibility is reflected in the large and continuous increase of farm tenancy in recent decades in the United States. In 1880, 25.6% of the farms were operated by tenants. In 1920, 38.1% of the farmers were tenants.[1] Between 1910 and 1920 the number of farms operated by owners decreased about 23,000; the number operated by tenants increased by about 100,000. It is specially significant that the number of share tenants increased about 278,000 while the number of cash and unspecified tenants decreased by about 178,000. The percentage of tenant farms increased in more than half of the states. Of the states showing an increase of over 40%, the following showed the largest percentages of growth:

Montana	177.6%	New Mexico	86.8%
Wyoming	119.4%	Colorado	64.0%
Idaho	110.2%	Utah	62.0%
Arizona	109.2%	Washington	60.7%
North Dakota	86.8%		

At the present time it is estimated that the only states where the percentage of tenant farms is less than 20% are the New England and Mountain states.[2] In some of the leading agricultural states like Iowa, Illinois, Kansas, Texas, more than 40% of the farmers are tenants.

It is not easy to evaluate correctly the significance of the growing prevalence of tenancy. Much depends upon the character of the tenant farmer class, and upon the circumstances under which the tenure is held. A tenancy system that affords a progressive step to ownership on the part of young farmers without capital, and that assures the conservation of soil resources, is probably in accord with sound agricultural policy. But where tenancy is the result of a regression from ownership and involves haphazard and

[1] U. S. Department of Agriculture, Yearbook, 1923, p. 510. Preliminary figures from the farm census of 1925 show that 38.6% of the number of farms were operated by tenants. The number operated by owners and part-owners decreased 56,666.

[2] A. M. Loomis, *op., cit.* pp. 61–63.

opportunistic cultivation without responsibility, as appears to be the tendency in many parts of the United States, it involves serious dangers. The growth of tenancy in the United States is probably to be considered as a form of economic adjustment to unstable and unfavorable agricultural conditions. While it is not in itself bad, it indicates a disadvantageous situation for farm ownership and investment. This is clearly suggested by the figures given in Table 16 for the return for labor of owner and tenant operators. It suggests that there is taking place a transition to a different form of agricultural organization in the country, a form characterized by a greater distribution of the risk, that is, a more distinctly business and less a personal and family form of industry,[1] and one that may lead to deterioration both of the quality of our farm population and of our land resources.

Operating Expenses

This term, although inexact, may suffice to head the remaining and largest group of agricultural costs, those of materials, supplies, implements, machinery and commodities and services needed for repairs, improvements and the living expenses of those engaged in the industry, together with transportation and marketing costs. Although the price levels of these various commodities and services do not change alike, and their respective importance in the agricultural budget differs, they are similar in that they are affected by more or less common influences.

Transportation and Marketing Costs

These costs are not shown separately in the studies of agricultural expenditures quoted heretofore, since the estimates of agricultural income are based on the prices received by the farmer after freight and marketing costs are deducted. It is difficult, however, to measure in any comprehensive way the extent to which transportation and marketing costs are

[1] Tenancy is less prevalent in the United States than in England, Australia, New Zealand or Belgium; about the same as in Japan, China and France; and more than in Germany, Canada or Denmark. In most European countries, as in Denmark, tenancy is so regulated by long tenure contracts as to make it a well established and sound transition to permanent ownership.

borne by the producer, because of the great variety and complexity of conditions, especially differences in distance from markets, marketing processes, and kind of product. The subject is too complicated for full discussion here, but a few aspects of it may be outlined to show its relation to the agricultural situation.

Transportation and marketing costs are on the borderline between the fixed charges and the operating expenses of the farm industry. They have to be paid, in so far as they fall upon the producer, if he is to get any income from sales at all. Moreover, since freight rates are subjected to governmental regulation, and marketing costs are affected largely by wages and salaries of commission merchants, terminal employees, etc., this group of costs is naturally less elastic than are prices of agricultural products. In this sense they are charges more fixed than wages or the cost of commodities bought by farmers, although less so than taxes, interest and rents. But, as in the case of the latter items, it is the lag or discrepancy between their changes and the changes in farm prices that affects the economic position of the agricultural producer.

Freight Costs

Transportation charges create differences in the net income or "rent" of producers differently located, over and above other differences, fertility of the soil, labor and capital investment, etc. Prices received by farmers on the farm reflect these differences; but the average price of farm products may be assumed to represent the average income of all producers, and total transportation costs are therefore to be considered as a factor affecting the total agricultural income.

Of course no general assumption as to the incidence of freight charges on the farmer is safe. As in the case of taxes, his ability to shift transportation costs to the consumer on his products, or to the seller on what he buys, depends upon his competitive position in the market. In this respect, however, he is doubtless much weaker than the producer in other lines, because of his relatively unorganized position.

If it be assumed that the farmer pays the freight to the consumer on his produce and also the freight on the com-

modities and implements he buys, it may be estimated that the agricultural industry pays about one-eighth of the country's total annual freight bill, or about \$625 millions per year.[1] This item is equivalent to about 6% of the gross cash income of the industry in 1924–25; but it is probable that this is to be taken as a maximum.

Whatever the quantitative importance of freight charges in the agricultural income, it seems fairly clear that there has arisen since 1914 a maladjustment to agricultural prices similar to that which exists with regard to other fixed charges. It is impossible to secure any measure of changes in agricultural rates which will represent conditions for the country as a whole, because of the wide variations in freight-rate levels in different sections, and the great complexity of the rate structure. But if the average revenue per freight ton-mile be taken as an index of total freight costs[2] it is seen that while they rose less rapidly than farm prices up to 1919, they thereafter continued to increase to 1921, while farm prices fell rapidly. Since then freight charges have fallen. The effect of this discrepancy of course varied widely from section to section, depending upon the character of the product and the importance of freight transportation in reaching markets.

The reasons for the inflexibility of freight costs in comparison with agricultural prices are, however, fairly clear. The freight rate structure, which is the outgrowth of many factors involved in the industrial and agricultural development of the country, is so complex and interdependent in its parts that it is difficult to readjust quickly to changing conditions. It is impossible practically to change freight rates with changes in prices of commodities or to adjust them territorially with the fluctuations in crop conditions. Such

[1] This rough estimate is based on the total tonnage of agricultural products and animals originating on the lines of all carriers in 1924, and the estimates of the Interstate Commerce Commission for the average receipts per ton of the major classes of freight for 1923, given in Slason Thompson, "Railway Statistics of the United States," Chicago, 1925. Since the agricultural industry, according to the figures given on pp. 19, 103, in 1924 bought about one-tenth of the value of all manufactured products, it has been assumed that one-tenth of the freight receipts on manufactures, miscellaneous and merchandise freight for 1924 would represent the freight cost on articles bought by farmers.

[2] That is, both on what the farmer sells and what he buys. See Chart 12.

adjustment would require the vesting of enormous power and discretion in governmental agency. Moreover, the earnings of railroads and their rates are subject to governmental regulation, and their own expenses, consisting so largely of wages, are themselves rendered inflexible both by governmental supervision and close labor organization. All these factors tend to render the transportation element in the agricultural industry as a whole relatively constant and frequently out of adjustment with the widely fluctuating agricultural income. The wide fluctuations in agricultural prices in the final markets, indeed, serve to minimize the comparatively small and more gradual changes in freight rates. As has already been pointed out,[1] study has shown that the range of fluctuation of the price of agricultural products in the chief markets is often many times as great as the whole freight rate itself, and the effect of the latter on the price received by the farmer is often given undue weight. But in the case of producers unfavorably situated with reference to markets, and in periods of great price decline, the freight cost may wipe out a large part or all of the margin between production costs and prices.

In the long run, however, it is obvious that rates must be adjusted so that they will enable the railroads to render adequate and dependable service to the farmer at all times and in all sections, for such service is as important to the farmer's income as its cost itself. The advantages of being able to get his products to market promptly must be balanced with the cost. Irregular, slow and inadequate service may do agriculture more harm than can be made good by periodic adjustment in rates. Agriculture needs successful railroad service, just as the railroads need successful agricultural production.

Marketing Costs

Comprehensive data are not available for estimating the importance of, and changes in, marketing costs separately from transportation costs. Some indication of the rôle of this factor may be afforded, however, by noting the difference between the movement of prices received by farmers

[1] See p. 93.

and wholesale or market prices of agricultural products—a difference frequently ignored in discussions of the agricultural problem. This difference reflects the changing importance of transportation and marketing costs in the agricultural position. As Chart 12 shows, the prices received by farmers for all farm products rose less rapidly than wholesale prices of these products and fell more rapidly. The discrepancy was not so great, however, in the rise as in the fall. Up to 1917, when prices were rising faster than city wages and freight rates, the prices received by farmers followed closely, and in the case of food products even exceeded, wholesale prices. But thereafter freight rates and the wage element in handling costs, once high, fell less rapidly than prices, and the gap between what the farmer received and the wholesale price widened. In 1924 prices paid to farmers for food, for instance, were 26% above the pre-war level, while the wholesale price of farm products in cities was 43% higher, and the retail price of food 50% higher. Thus the farmers' actual cash income has lagged behind the agricultural price level, because of the inelasticity of freight and marketing costs. Since then, however, the gap has narrowed, until in 1925, the prices paid to farmers for food were higher relatively to the pre-war level than the retail prices in cities.

Marketing costs, as has been pointed out in Chapter III, are closely related to the irregularity of supply and demand, and so are a factor tending to reduce income from sales. They reflect in large part, for the industry as a whole, the losses due to spoilage in transit,[1] glutting of markets, and the failure of more systematic contact between producer and consumer. Much of these losses are gradually being obviated by better standardization, grading, and packing of products and better organization of producers.

Cost of Commodities Bought by Farmers

The factors which lie behind the discrepancy between the movement of farm prices and that of freight and marketing

[1] This is in large part due to lack of organization in shipment. In 1923 the railroads paid over $10 millions for losses and deterioration in the course of shipment of perishable products, or about 4% of the freight. This factor thus tends to keep freight rates higher than they could otherwise be. See address by Herbert Hoover, before The American Dairy Federation, Milwaukee, October 1, 1924.

costs are brought into full play most clearly in considering the largest item of agricultural costs—the machinery, implements, building materials, food, clothing and sundries purchased by farmers for their operating, maintenance and living needs. These costs form more than 60% of the costs of the industry, since, as has been emphasized, the living costs of the farmer are not easily separable from his business costs, in the present organization of American agriculture. These costs, it is true, are more elastic than taxes, interest, rent, freight and handling charges in relation to agricultural prices, but since they are so important in the industry, the degree of their adjustment to farm prices is so much the more vital, and has therefore received so much the more attention.

Space does not permit the separate examination of each of the particular items in this group, even were data available to estimate their relative importance in the farm budget and their changes relative to farm prices. Considering them as a group under the general head of "non-agricultural commodities," Chart 12 shows the movement of their wholesale prices relative to wholesale prices of farm products.

The chart shows the familiar fact that while farm product prices rose on the whole more rapidly than non-agricultural prices up to 1920, they thereafter fell off more rapidly, and that the pre-war relationship has not yet been fully restored, although it has been considerably improved. Wholesale prices of non-agricultural commodities in 1924 were about 62% above the pre-war level while wholesale prices of all agricultural commodities were about 40% higher. Since then readjustment has proceeded until in 1925, prices of non-agricultural commodities averaged 64% above the pre-war level and farm product prices 56% higher.

If the available data on retail prices of machinery, supplies, construction, food, clothing and sundries are related to prices received by farmers, as shown in Table C,[1] it is seen that the discrepancy differed considerably as among the various items. Building and living costs were relatively higher than farm prices, while the prices of farm implements and fertilizer were lower.

The economic factors which have given rise to this malad-

[1] See page 157.

justment are complex, and it is difficult to deal with them justly. Fundamentally, as has been pointed out in preceding chapters, it is due to the fact that agricultural prices are determined by world conditions, while the costs of the agricultural industry are affected primarily by national or local economic forces.

The effect of this difference upon the prices of agricultural and of non-agricultural commodities, however is determined by many complex and interrelated factors, the influence of which is difficult to distinguish. The following are perhaps the most significant:

1. The first is the fact that the demand for agricultural products is relatively inelastic or constant, while that for industrial products apparently has no limit except the effective purchasing power of consumers. This implies that, other things being equal, the price level of manufactured products would tend to rise faster or remain on a higher level than that of farm products, especially in periods like that following the war, when there was a world-wide dislocation of manufacturing industry, while agricultural production as a whole was maintained at a relatively normal level or rapidly restored.

2. But the operation of this factor in turn is dependent upon the purchasing power of consumers, that is the level of industrial wages. Other things again being equal, the rise of industrial wage levels tends to increase the demand for manufactured products faster than that for agricultural products and so raises the price level relatively.

3. Wage levels of non-agricultural workers, however, are not only the largest element of manufacturing and transportation costs, but enter ultimately into the cost of governmental services and affect credit conditions and interest rates. They therefore tend to affect prices directly, other things being equal. Since wages represent about half the revenues paid the railroads, a sixth of the value of manufactured products bought, and 90% of the governmental services provided by taxation, it may be estimated that at least a quarter of the expenses of agriculture are wages of urban workers. Through the influence of better labor organization, immigration and other restrictions upon supply, and especially because of

the fact that increased incomes create new standards and habits of living which are slow to change, the wages of urban workers rise faster than they fall and do not adjust themselves elastically to price changes.

4. Prices of non-agricultural products, however, are affected not only by the relatively elastic demand for them, the purchasing power of labor and the cost of labor, but by the effectiveness of competition among producers, and this depends partly upon their domestic organization and partly upon restrictions affecting the international flow of manufactured commodities. Other things again remaining the same, the close organization or combination of producers and their protection from foreign competition by the tariff would tend to raise the domestic price level of manufactured products relative to the price level of agricultural products in so far as the producers of the latter are not so organized or protected.

5. Finally, it is evident that all of these factors do not operate with other things remaining the same, but that the determining element in all of them is the efficiency of industrial production. The improvement of industrial management and the advance of technical knowledge, power and machinery, tend to lower costs, to lower prices relatively to wages, to expand both the demand for industrial and agricultural products and the consuming power of the workers, and to render limitations upon competition, either domestic or foreign, more ineffective. On the other hand, the price influence of the artificial factors tending to raise industrial wage levels, of limitations on domestic competition and of the tariff, tends in the long run to be proportionate to the failure of industrial efficiency to advance.

In studying the relation between the prices of agricultural and those of non-agricultural products—a relation that figures so prominently in discussions of the agricultural situation—it is important to bear in mind several considerations which qualify the significance of such comparisons. In the first place, it must be remembered that the relation of the current indexes of wholesale prices of non-agricultural commodities, or of general wholesale prices, to those of prices of farm products does not accurately portray the purchasing

power or exchange position of the farmer. He buys only certain non-agricultural products and he buys these at retail. Moreover, he does not buy only manufactured products, but also goods which are directly or indirectly farm products, as well as other services the price of which is not reflected in these indexes. In the second place, it is evident that a comparison of the relation of farm and non-agricultural prices today with their relation in the pre-war period does not necessarily throw any conclusive light on the economic position of the farmer today. The significance of such a comparison depends upon the actual economic position of the farmer in the period with which the comparison is made. Table 15 indicates, however, that the position of the industry in pre-war years was not extraordinarily favorable, so that the discrepancy between the prices of farms and non-agricultural products today probably does not exaggerate the unfavorable situation, although there has been definite improvement since 1921.

Foreign Trade

Further, it should be noted that international trade changes affect not only agricultural income, as has been seen in the preceding chapter, but agricultural costs as well, in so far as the prices of manufactured goods enter into these. The transfer to the United States of large amounts of purchasing power in payment of debts and reparations, except so far as this is postponed by proportionate loans to foreign countries, must tend ultimately to diminish the demand for agricultural exports abroad and to increase the importation of raw materials and manufactured goods from abroad. These changes may have a far-reaching influence upon the economic position of agriculture, both in respect to its income and to its costs; but this subject is too broad in scope to be discussed here.[1]

Buying Organization

In respect to the costs of the commodities bought by farmers, as well as to some of the services like credit and

[1] See National Industrial Conference Board, "The Inter-Ally Debts and the United States," New York, 1924, Chapters VII and VIII.

transportation, the unorganized status of agricultural consumers has doubtless been a factor in their economic position on the side of costs as it has been on the side of income. The organization of farmers for buying supplies, machinery and living requirements is as yet relatively small in comparison with their organization for marketing. In 1924 the Department of Agriculture reported 1,147 buying associations with a total membership of 250,000 and doing a business of $120 millions, as compared with 9,013 selling associations with a membership of 1,775,000 and doing a total business of $2,080 millions. The total business of these associations constituted less than 2% of the total purchases of the industry.

Depreciation

Special emphasis should be placed upon the costs of maintenance or replacement of the basic real capital of agriculture—the soil resources and the buildings and machinery. When other costs—fixed charges and living costs—press hard upon the farm income, it is probable that these depreciation costs are not met, or are postponed and become a growing liability on the future income. It is not possible to measure accurately the extent to which this has been true of American agriculture as a whole in recent years. The trend of yield of the principal crops since 1900 pointed out in Chapter II affords some suggestion that such a process has been going on.[1] It is estimated that our crop lands require 9,000,000 tons of nitrogen per year to restore the fertility in this respect alone. Only 5,450,000 tons are used, 3,500,000 tons of which are supplied by the farm itself directly or indirectly through crops which require 5,800,000 acres of land for that purpose annually.[2] In other words the deficiency in respect to nitrogen alone amounts to nearly 40% per year at the present time.

In 1920 the total expenditures for fertilizer are estimated at about $377 millions and in 1921 at $205 millions.[3] It is estimated[4] that the leading crops absorb annually about

[1] As has been indicated, however, fertility is not the only factor in this trend.

[2] Figures supplied by Mr. E. H. Hooker, President, Manufacturing Chemists' Association of the United States.

[3] National Bureau of Economic Research, "Income in the Various States," 1925.

[4] Based on data of the National Fertilizer Association and upon wholesale prices of the fertilizer materials mentioned and of commercial fertilizer.

17 billion pounds of ammonia, phosphoric acid and potash, which are valued at about a billion and a quarter dollars, or more than one-tenth of the value of the crops. These elements were replaced in 1925 by about 2,400 million pounds of plant food from commercial fertilizer, valued at about $225 millions, leaving a deficit of above 14½ billion pounds of plant food. Assuming that, as in the case of nitrogen, about 60% of this deficit is made up by animal manures and other ways through the farm itself, there would remain a deficit of 5,800 million pounds of plant food valued at least at over $400 millions, which should be charged up as a capital loss to the industry annually. This takes no account of other forms of land depreciation, such as failure to improve drainage, etc.

Similar considerations apply to equipment and buildings. The estimated expenditures for farm implements, harness and saddles and business buildings in 1920 and 1921, compare with the value of buildings and equipment in 1920 as follows:[1]

	Value, 1920 (millions)	Expenditures, 1920 (millions)	Per Cent of Value, 1920	Expenditures, 1921 (millions)
Buildings..............	$11,486	$232	2	$171
Machinery and Implements................	$3,594	$721	20	$412

Remembering that these expenditures represent in part the cost of additional equipment, it would not appear that they are in excess of, if equal to, the normal depreciation requirements. Although the decline in expenditures in 1921 represents in part lower prices, it probably reflects also the fact already noted, that in depression periods maintenance costs are postponed. The expenditures for fertilizer also declined from $377 in 1920 to $205 millions in 1921, as has been noted.

Since the yield per acre, under conditions of high overhead costs, is the most important factor in reducing the unit cost of production, the neglect of soil fertility to the extent now apparently taking place in this country means a prospect of

[1] Figures of value in 1920 from U. S. Census of Agriculture, 1920; estimate of expenditures from National Bureau of Economic Research, *op. cit.*

increasing costs for the industry in the future. Although the labor force in agriculture is the most efficient in the world, the same cannot be said of our agricultural "plant," and this is due partly to the smaller application of fertilizer, and partly to inability in some sections to make headway against pests, diseases and weeds. In North Dakota, for example, the average yield per acre of wheat has fallen to about ten bushels in the past ten years as compared with from 15 to 20 bushels before 1916.[1] In 1922 the average yield per acre of wheat and potatoes, and the average application of plant food per acre in the United States compared with those in European countries as follows:[2]

	Yield per Acre (Bushels)		Plant Food (Pounds)
	Wheat	Potatoes	
United States	13.9	105.3	5.1
Holland	41.1	340.3	168.4
Denmark	39.0	241.4	14.6
Belgium	35.4	324.6	30.4
England	31.2	267.0	19.0
Germany	20.5	222.2	65.0

The discussion thus leads back to the fundamental question with which it started, namely, the conservation of our agricultural resources. When, through the operation of all the factors described, the income from production fails to exceed or to meet the ordinary costs, the farmer may maintain himself for a while by deferring the conservation costs or the basic capital replacement costs; but it is evident that this cannot go on long—perhaps, if the figures given above be taken as a guide, 50 years for buildings, 5 years for machinery and equipment, and 3 years for soil fertility. That the farmer has been forced to do this is evident from the following comparisons. Taking the three most important grain crops for which data are available, studies by the Department of Agriculture[3] covering between 2,500 and 11,000

[1] J. L. Coulter, President, North Dakota State College of Agriculture, *Journal of the American Bankers' Association*, February, 1926.

[2] National Fertilizer Association, *Fertilizer Review*, January, 1926.

[3] *Crops and Markets*, Monthly Supplement, June, 1925, p. 181. It should be noted that the Illinois Agricultural Association, on the basis of an audit covering 57 farmers' elevators in Illinois, concluded that the figures given in this table for the prices paid farmers for wheat, corn and oats in 1924 were higher than the prices actually received in that state. The values given by the Association were: wheat $1.228; corn $.959; and oats $.444 per bushel.

farmers show the following relation between net costs (including transportation to the local market only) and the farm value of wheat, corn and oats:

	Net Cost Per Bushel			Value of Product Per Bushel		
	Wheat	Corn	Oats	Wheat	Corn	Oats
1922	$1.23	$0.66	$0.53	$1.11	$0.73	$0.48
1923	1.24	.68	.52	.99	.81	.49
1924	1.22	.82	.50	1.43	1.10	.57

When the value of the minerals and plant food in each bushel of these products is considered,[1] it would appear that in few cases in these favorable years has the price received by the farmer much more than equalled the cost of production, including soil depreciation.

These considerations are frequently ignored when the possible economies of extensive specialized cultivation with machinery are being discussed. In the opening of new land, when taxes and other overhead charges per acre are relatively low, such methods for some time show a book profit on current costs. But this current profit is often at the expense of the future and really comes out of the basic capital of the land resources. Such production is frequently not cultivation of the soil but extraction of its minerals—it is not agriculture but mining.

Productive Efficiency

When the problem of agricultural costs is viewed as a whole, it appears that the primary factor in the discrepancy between the level of costs and that of income is the high overhead cost per unit of product due to the high level of taxes and debts, combined with the relatively low yield per acre. If there is inefficiency in American agriculture it is one of the "plant" operation and maintenance rather than of the working force; for, as has been indicated, the American production per worker is far higher than in other countries. But the greater yield per acre in other countries has involved higher labor costs, harder work and more workers per acre and consequently a lower living standard for each worker.

[1] About 6¼ cents per bushel of wheat, and 2½ cents for corn and oats, including phosphoric acid, ammonia and potash at prices paid by the farmer.

Whether the economic position of American agriculture will similarly make it necessary to meet capital charges by more intensive cultivation and increased direct labor costs, or whether it will be possible to increase the yield per acre by cheaper fertilization and new uses of machinery and power, while the acreage thus released is reforested or used for producing industrial materials of expansible demand or better markets—this is the essential problem facing the industry in respect to costs. In any case, in large sections of the country extensive revision of the farming system through diversification and other ways designed to meet these problems has been necessary and has gradually gone forward in recent years. Minnesota, for instance, was the leading wheat state in 1900, but has since reduced her wheat acreage 75% and become the leading butter producer, in this way meeting with some success the situation brought about by declining yields and high taxes and debts.[1]

Individual Factors

In conclusion it must be recognized that all these general influences underlying agricultural costs and income obviously affect individual farmers differently according to the skill, intelligence, energy and foresight with which they meet and adjust themselves to the special conditions which confront the industry as a whole. Agriculture, as has been emphasized, is a peculiarly individualistic industry and it probably offers as much scope for individual initiative in relative reduction of costs and superiority of management as other business enterprise. Such differences persist no matter how general and fundamental conditions may change or be changed by artificial factors for the industry as a whole. Legislation cannot remove them in agriculture any more than it can in other enterprise. A large measure of responsibility for the stabilization of income and reduction of costs inevitably remains with the individual farmer, and the individual farm is the place where the last word is said in balancing income and costs. Although it is evident from the whole of the preceding discussion that there are general conditions adversely affecting the position of the industry as a whole,

[1] J. L. Coulter, *op. cit.*

foresight in extension of acreage, discretion in incurring debts, wisdom in diversification and rotation of crops, care in selection of seed and breeding of stock, effort toward increasing the yield per acre and reducing unit costs, loyalty of co-operation and intelligence of management in organization for marketing—all these have doubtless been none the less important and effective than always in enabling individual farmers to meet adverse influences. In fact, the instability and high risk of the industry, its domination by natural conditions, its individualistic character, have rendered them more vital than in many other branches of economic life. It is the wide differences in these respects among the millions of individual enterprisers who constitute the industry that give an appearance of unreality to any general description of agricultural conditions and that render dangerous and difficult the prescription of general remedies for them.

Summary

The outstanding feature of the trend of agricultural costs is that they have tended to be greatly inflexible in relation to agricultural income. This arises partly from the fact that production in agriculture is dominated by natural processes and conditions, but chiefly from the fact that its costs are determined by local or national conditions, partly artificial in character, while the bulk of its income is subject to the influence of world conditions and values over which it has little control. In brief, the agricultural industry produces on the basis of costs or values domestically determined, while it sells from 30% to 60% of its product on the basis of prices or values determined by foreign conditions of cost. The rise in overhead costs involved in taxes and debts is probably the most important factor in this discrepancy, and is likely to require extensive changes in the system of farming in this country to secure greater "plant" efficiency without increased direct labor costs.

CHAPTER V

GENERAL SUMMARY AND CONCLUSIONS

The rapid industrial, commercial and financial development of the United States during the past quarter century has tended to obscure the changes in the position of American agriculture, to divert public attention from its problems, and to make their importance less clearly and generally understood. It is, however, vital to the economic prosperity, social advancement, political unity and national security of the country that all groups give full consideration to the position and problems of our agriculture in order to ascertain whether, in what respects and why our agriculture may have failed to keep pace with the rest of our economic development, and in order to establish a sound basis for co-operation and mutual adjustment in restoring that industry to its proper rôle in our national economic life.

Agriculture is a determining factor in our economic welfare.

It normally exerts a purchasing power for nearly ten billion dollars' worth of goods and services of other groups annually.

It purchases annually about a tenth of the value of the products of our manufacturing industries.

It supplies materials upon which depend industries giving employment to nearly half of our industrial workers.

It pays indirectly about two and a half billions in wages of urban workers.

It supplies about an eighth of the total tonnage of freight carried by our railroads.

Its products constitute nearly half of the value of our exports.

It pays in taxes one-fifth of the total cost of government.

The capital invested in it in 1919 more than equalled that invested in our manufacturing industries, mines and railroads combined.

It represents about a fifth of our national wealth, and normally contributes about a sixth of the national income.

Since it supplies not only the food for our industrial workers, but about a third of the materials of our industries and a market for a large part of their products, it forms the basis of our industrial prosperity.

Since, also, the farm population forms about thirty per cent of our total population and constitutes a reservoir from which must be drawn a large part of our future citizens, the standards of living and the social welfare of this group cannot but have an important effect upon the racial quality of our people.

Moreover, the political attitudes of this group must have in the future, as they have had in the past, a determining influence upon the character and development of our political institutions. These attitudes are inevitably affected by the economic and social condition of the agricultural community.

When, finally, it is realized that the strength of our agriculture may have a vital bearing on our national security in the future, it becomes clear that the position of agriculture involves a far-reaching question of national policy, rather than a problem of immediate, temporary or special adjustment. It requires the creation of a sound, consistent, farsighted program of economic development, embracing and justly balancing all interests in the light of considerations of national security, economic prosperity, social welfare and political unity.

The problem is rendered enormously difficult and complex because of the inherent instability of agricultural production and the diversity of the groups and interests involved in the industry. Agriculture, unlike most other economic activity, is limited by natural resources and dominated by natural conditions. Agriculture is predominantly an individualistic, small-scale, proprietary industry, relatively unorganized, specializing in the production of large quantities of a relatively few homogeneous commodities, in certain sections of the country, and dependent for its own requirements upon the exchange of its own product for those of other groups. It presents an inseparable intermixture of a way of living,

an investment, a business and a gainful occupation or employment.

From the point of view of national policy, the most important aspects of the industry to be considered are: the trend of development of the agricultural "plant"—that is, the land resources of the country which are the basis of the industry; the trend of the economic position of the industry as a whole, in respect to the value of its products and the costs of production; the economic position in respect of return for labor and investment of those who own and work farms, who form the working force and capital of the backbone of the industry; the conditions affecting the most important branches of production—cotton, wheat, corn, livestock, hogs and dairy products—in the sections where these branches are concentrated; and, finally, the factors underlying these changes and current conditions in the industry as a whole and in its major branches.

In these respects the available information indicates the strong probability that, for a considerable period before the war, and at least as early as the beginning of the present century, there have been in operation forces which have tended to create a progressive inequity and maladjustment between the position of agriculture and that of other branches of our economic life.

This is reflected in the following conditions:

1. The contraction of our agricultural "plant" and its production relative to the growth of our population.

2. The increasing effectiveness of competition of foreign producers in both foreign and domestic markets, shown by the downward trend of exports and the rise of imports after 1900, both of which were interrupted only temporarily by the exceptional conditions during the war period.

3. The rapid rise in capital, labor and operating costs relative to the price per unit of product since 1900.

4. The persistent and increasing disparity between the per capita share in the national income of those engaged in agriculture and that of those engaged in other major occupations.

5. The disparity between the return for investment and labor in agriculture and that in other activities.

6. The rapid increase in the rate of farm bankruptcies compared with that of commercial failures since pre-war years.

7. The wide disparity between the per capita income of the farm population and that of the non-farm population in the dominantly agricultural sections of the country.

The available information in all these respects strongly suggests, although further investigation is necessary to establish, that while the position of agriculture since 1920 reflects chiefly the disturbance and upheaval of the war and post-war period, unfavorable factors in the agricultural situation have been in operation since the beginning of the century, and have been in some way related to the rapid expansion of industry, trade, finance and government during the past twenty-five years.

This situation appears to have arisen out of fundamental conditions affecting agricultural income on the one hand and agricultural costs on the other. These conditions are partly inherent in the nature of the productive processes of agriculture, and partly circumstantial or artificial, arising out of institutional arrangements affecting the interrelationships of agriculture, industry, trade, transportation, finance and government.

The inherent conditions lie in the fact that the production and consumption of farm products are dominated by natural processes. The demand for food is not so elastic as that for other commodities and services. The quantity and costs of production are not quickly or completely controllable in relation to demand and price. Production depends upon weather, plant diseases and pests far more than upon acreage, and costs are fixed more largely by natural processes, soil fertility and time than by human agency.

Although these inherent conditions are subject in great measure to the influence of scientific knowledge and improved methods of management and production, for the most part they constitute basic conditions which agriculture must meet through improvement in its external business relationships. They prevent the farm from being a factory in respect to its productive processes; but they do not prevent farming from being a business in its other aspects, for

the influences which affect the business aspects of agriculture are for the most part artificial or circumstantial.

Among the more important factors of this kind affecting income and costs in agriculture are the following:

1. The influence upon production of changes in the planted acreage and in the acreage harvested, arising from the land settlement or land utilization policies of national or local governments, the stimulation of land settlement by railroads and other private agencies, reclamation policies of national and local governments and the influence of local interests upon these, the expectation of farmers regarding general agricultural prospects and price trends, and general credit conditions. Although all of these factors have played a part in the variations in production over long periods in the past, and annually at the present time, it is probable that acreage as a whole has become or is rapidly becoming adjusted to our population growth, and that the major influences upon the production from year to year in the future will be variations in yield and shifts of acreage between different lines of production.

2. The influence of changes in demand for agricultural products arising out of population growth, changes in prices, changes in dietary customs and consumption habits, and changes in industrial activity which affect the demand for farm products used in industry. Although wide changes in industrial activity employment and wages at home and abroad have affected the consumption of farm products, in the long run the demand for food products tends to be relatively inelastic and to depend upon population growth. On the other hand, the demand for agricultural products used in industry, while varying widely with changes in industrial activity, is indefinitely expansible.

3. The influence of world conditions of supply, demand and cost of production upon the most important agricultural products. It appears that from 30% to 60% of the agricultural income from sales is affected by competitive conditions in the world market. This arises from the fact that in these products we have varying annual surpluses for export, while the production of these commodities abroad is expanding through the opening of new territory and the

stimulation of domestic production by foreign countries. From the world point of view, however, it is doubtful whether there are, over periods of several years, any real surpluses of production in relation to the total demand. It does not appear that the world production is growing much more rapidly, if as rapidly, as the world population. These surpluses therefore represent largely the failure of adjustment between production and demand in special products within short periods or in particular localities. Although in some degree susceptible of control through national or international organization of producers, little successful effort has been made in this direction.

4. The influence on prices and agricultural income of lack of organization and system in the marketing processes. As indicated in the preceding paragraph, this applies in some measure to the relation between world supply and world demand, although the latter is not easily subject to domestic control. Normally at least 40% of the agricultural income from sales, however, is determined by the relation between supply and demand in the domestic market, in which there is scope for more regularized marketing through business organization of producers.

5. The influence of distribution costs and wastes upon the spread between the general market price and the price received by producers. This spread is very wide in most agricultural products and reflects lack of organization, standardization and grading in marketing, as well as changes in transportation costs and changes in wage levels of those engaged in trade and distribution. For the latter reason distribution costs tend to be more inflexible than agricultural prices, so that wide changes in price and wage levels greatly affect the spread between market prices and prices received by the farmers. Although these distribution costs can probably not be altogether eliminated, there is wide scope for achieving a more systematic contact between producer and consumer.

6. The influence of changes in general price levels due to credit conditions. Such wide changes in general price levels as occurred during and after the war period tend to introduce great discrepancies between agricultural income and agri-

cultural costs and tend particularly to affect the values of farm property and the burden of fixed charges.

7. The influence upon agricultural costs of domestic or local conditions in respect of fiscal, tariff and immigration policies, industrial efficiency, industrial, financial, trade and labor organization, transportation and credit. Since practically all agricultural costs are determined by these domestic and local conditions, while a large part of the agricultural income is determined by international conditions, there has arisen since the beginning of the century a progressive discrepancy between income and costs which has retarded the prosperity of the agricultural industry, and which has been in part beyond the control or influence of the agricultural producer. In short, these domestic and local conditions have created and maintained a scale of values in respect to agricultural costs that has tended to be higher than the world level of values by which agricultural income is determined.

Because of these conditions, inherent and circumstantial, American agriculture appears to have fallen out of step with the general economic development of the country. While it has become inseparably involved in a network of inter-relationships with a more and more highly organized system of industry, trade, finance, transportation and governmental activities, it has so far not developed effective means for adjusting itself to this new situation. It appears to have made its adjustment in recent years largely through sacrifice of its capital assets, through sacrifice of the soil resources of the nation and through increased direct labor costs.

While there has been a distinct and rapid improvement in the economic position of the average farmer since 1921, in the latest year for which comprehensive information is available there is still evident a wide disparity in the position of the industry. The great deflation which agricultural values have suffered since 1920, the abandonment, foreclosure and bankruptcy of farm enterprises reflected in the exodus of the farm population and the general contraction of the industry that have taken place in the past five years, may be regarded, if viewed in the most favorable light, as a phase of a profound transition through which the industry has been passing during the past generation, in the

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process of readjustment to the new economic conditions that have developed in this country since 1900.

It is probable that differences in intelligence, foresight and energy among individuals in the industry, leading many to unwise extension of acreage and debts, neglect of diversification and rotation of crops, lack of care in selection of seed and breeding of stock, indifference to declining yields and soil fertility, have contributed to these conditions. Dissension, incompetence of management or lack of experience within farm organizations may have added to the disappointments which have been met in the effort toward better adjustment of the industry to its new situation. Support of unwise banking and other legislation fostered by self-seeking political leaders in some sections, and even nationally, may to some extent have aggravated both the unrest and the conditions which it reflected. But it is probable that, beneath these phenomena, there have been fundamental conditions which have created real difficulties for the industry as a whole and which were, in part at least, beyond its control, even though they may have been emphasized by unfortunate political and legislative circumstances.

These fundamental underlying conditions may be removed or altered in the course of time through the slow operation of economic forces; they may be the reflection of a long cycle arising from natural forces, to which agriculture is subject, and which is as yet little understood; they may be the inevitable accompaniment of the present stage of economic development of the country. The analysis in this report strongly suggests that they are not transient phenomena, confined to special sections or branches of the industry; but that they have been in operation for a long period and have affected the industry as a whole. In so far as this is true it is obvious that they cannot be properly or adequately met by extemporized legislation, improvised in the light of current political situations, to meet the needs or demands of special sections of the country or branches of the industry. If agriculture is confronted with fundamentally adverse conditions, making for a general and persistent inequity and maladjustment, they not only constitute a serious menace to the progress and prosperity of American industry, commerce

and trade, but are equally of great significance for our national welfare, for they deeply affect the future economic development, the social advancement, the political unity and the national security of the United States. This situation presents a far-reaching question of national policy and therefore demands clear and full understanding, careful and open-minded consideration, and earnest effort toward readjustment on the part of all major economic groups in our country.

Despite the serious and long-continued adverse conditions that have confronted agriculture, there is no ground for believing that they are insurmountable. Other branches of business and industry have at times in the past met unfavorable conditions that have carried them to the verge of catastrophe; but where the industry was basic and its products of real service, and where intelligence and energy have been summoned to the problem, recovery has always followed. There is even better reason for confidence in the future of American agriculture. The farm serves the most basic and universal of human needs. Nearly half of the average family income of the mass of our people is spent for food. In good times or bad times the demand for food is an imperative need. Every child born brings a new mouth to be fed daily through a lifetime. An industry based on such a market may face the future with greater confidence than many others, and is certain to find means of adjustment. The very fact that its problems are now the center of public attention gives promise that their solution is not far off. As the business men of the country come to realize the fundamental importance of a sound agriculture, the farmer may be assured that any assistance they can effectively render will be given, and any remedial measure that will stand the test of economic law will find the necessary support to put it into operation.

From this point of view, it would seem proper and desirable in the national interest for leading representatives of American industry, commerce, transportation and finance, in conjunction with leaders of agriculture, to study jointly and sympathetically, on the basis of the Conference Board's report, the agricultural situation and its causes, to appraise its consequences and to present for the consideration of the public their mature judgment of the possibilities and desirable avenues of remedy and

readjustment. In this way it is possible that, apart from the disturbing and transient influence of partisan politics, there may be provided a constructive and practical plan for mutual understanding and full co-operation between agriculture and all other groups in our productive life, as well as a basis upon which may be developed a sound and far-sighted national policy embracing and justly balancing all the interests involved.

The agricultural problem is essentially an economic problem; its solution should be sought through the co-operation of all economic interests along sound economic lines. There are few problems more complex, more changing, more difficult to comprehend, more charged with political and social import, or calling for more careful, earnest and open-minded study by all our people. It is not desirable or feasible for others to undertake to solve the farmer's problem for him or arbitrarily to suggest how he may solve it for himself. The responsibility for the agricultural situation and its correction rests upon all groups in common. Outstanding business leaders in the major economic activities of our national life, selected by their respective national organizations or otherwise, may well address themselves to the important task of co-operating in the effort toward agricultural readjustment to the end that the country may be assured of a prosperous agriculture as a part of a prosperous national economy.

APPENDIX

APPENDIX

FOOTNOTES FOR TABLE 15

Col. 1: Estimates of National Bureau of Economic Research, "Income in the United States," New York, 1922, Vol. II, p. 63. Includes an allowance of one per cent. for cash working capital.

Col. 2: Based on Estimates of National Bureau of Economic Research, *op. cit.*, p. 55. These estimates give the value of crops and animal products, including food and fuel produced and consumed by farmers, but excluding feed and seed produced and used in production of crops and livestock. To these figures has been added the rental value of farm homes, estimated by the National Industrial Conference Board on the basis of figures for rentals of farm homes found by the Department of Agriculture in surveys of living costs of farm families in 1924–25. These figures have been adjusted by the National Industrial Conference Board's index of changes in rents of wage earners' homes since 1914. No change is assumed between 1909 and 1914. These estimates of rental value, based on a selected group, are probably higher than the average. Consequently the estimates of gross income in this column are probably too high.

Col. 3: Estimates of L. M. Graves, "Interest and Taxes in Relation to Farm Income," *Annals of the American Academy of Political and Social Science*, Philadelphia, January, 1925, p. 37. Figures are for fiscal years beginning in the respective years given and are based partly on the estimates of the National Industrial Conference Board, "Tax Burdens and Exemptions," New York, 1923, p. 29. These estimates accord generally with those for the total property taxes paid on farms given by the Department of Agriculture. Figures for fiscal years beginning in the years designated are taken as representative of calendar years.

Col. 4: Estimates of National Bureau of Economic Research, *op. cit.*, p. 56.

Col. 5: Based on L. H. Bean and O. C. Stine, "Income from Agricultural Production," *Annals of the American Academy*, *op. cit.*, January, 1925, p. 29, and National Bureau of Economic Research, *op. cit.*, p. 59. These values are calculated on the basis of wages of hired labor.

Col. 6: Estimates of National Bureau of Economic Research, *op. cit.*, p. 54. Interest on bank loans is included. These estimates appear to be low in view of those made by the Department of Agriculture for the period 1919–25 given in Table 16.

Col. 7: Col. 2 minus the sum of cols. 3, 4, 5 and 6.

Col. 8: Ratio of col. 7 to col. 1.

Col. 9: Interest on total value of property is calculated at 5% from 1909 to 1918, inclusive, at 5½% in 1919 and at 6½% in 1920.

Col. 10: Col. 2 minus the sum of cols. 3, 4, 6 and 9.

Col. 11: Estimates of the National Bureau of Economic Research, *op. cit.*, p. 63.

Col. 12: Col. 10 divided by col. 11.

Col. 13: L. H. Bean and O. C. Stine, "Income from Agricultural Production," *Annals of the American Academy*, *op. cit.*, January, 1925, p. 32, and U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, July, 1925.

Col. 14: Paul H. Douglas, "The Movement of Real Wages and its Economic Significance," paper presented at Annual Meeting, American Statistical Association, 1925; based on annual earnings of employed workers in manufacturing industries, transportation, clerical occupations in transportation and manufacturing, clergymen, teachers, postal and government employees. *American Economic Review*, March, 1926, Supplement.

FOOTNOTES FOR TABLE 16

Col. 1: U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, July, 1925, pp. 236ff. Includes an allowance of one per cent of the value of farm property for cash working capital.

Col. 2: *Ibid.*, pp. 236 ff.

Col. 3: Based on *Ibid.*, pp. 236 ff., taking value of farm production at prices received by farmers, excluding value of feed, seed and waste consumed in production of crops and animal products, and including value of food and fuel supplied by the farm, together with value of house rent estimated by the National Industrial Conference Board, as described in footnote to Col. 2, Table 15.

Col. 4: Based on U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, July, 1925, pp. 236 ff. There is some discrepancy between these and other estimates of total property taxes, but it is not large. These figures do not include indirect taxes paid by the agricultural community. All property and direct taxes paid by farmers are here considered to be taxes on the farm business.

Col. 5: *Crops and Markets*, *op. cit.*

Col. 6: *Idem.*

Col. 7: *Idem.*

Col. 8: *Idem.* These estimates include interest on mortgage and personal indebtedness.

Col. 9: *Idem.* These figures are taken to include rent paid by part-owners.

Col. 10: *Idem.* Represents products and services of other industries bought for business purposes, and repairs and maintenance of equipment. Building expenditures are not included. These estimates appear high in view of those of the National Bureau of Economic Research for 1919, 1920 and 1921, given in "Income in the Various States," *op. cit.*

Col. 11: Col. 3 minus the sum of cols. 4, 6, 7, 10.

Col. 12: Col. 11 divided by col. 1.

Col. 13: 60% of col. 3 minus (col. 5 + 60% of col. 6 + 60% of col. 7 + 60% of col. 10 + col. 8 + 20% of col. 9) divided by col. 2. The number of owner operators is taken as 60% of the total number of operators, on the basis of the percentage of the number of farms and value of farm land and buildings operated by owners and part-owners shown by the Census of 1920. It is considered that 20% of the total rent paid on rented property is paid by part-owner operators, on the basis of the ratios of the number of farms, acreage and value of property operated by part-owners to those operated by tenants and part-owners combined in 1920.

Col. 14: Col. 3 minus (col. 4 + col. 6 + col. 10 + 5.5% of col. 1).

Col. 15: Interpolated on the basis of the decrease in the number of farms from 1920 to 1925, U. S. Department of Commerce, Census of Agriculture, 1925, "Number of Farms."

Col. 16: Col. 14 divided by col. 15.

Col. 17: 60% of col. 3, minus (col. 5 + 60% of col. 6 + col. 8 + 20% of col. 9 + 60% of col. 10 + 5.5% of col. 2) divided by 60% of col. 15.

Col. 18: 40% of col. 3, minus (40% of col. 6 + 80% of col. 9 + 40% of col. 10) divided by 40% of col. 15.

Col. 19: *Crops and Markets*, *op. cit.*, p. 237.

Col. 20: Paul H. Douglas, *op. cit.*

Table A: Index Numbers of Prices and Elements of Cost per Unit of Agricultural Production, 1879–1923

(1879–1883 = 100)

Period	Wholesale Prices of Farm Products[1]	Capital Charges[2]	Labor Costs[3]	Material Costs[4]	Composite Costs[5]
1879–1883	100	100	100	100	100
1889–1893	88	109	102	101	105
1899–1903	92	105	95	104	99
1909–1913	124	152	137	147	143
1919–1923	214	403	207	238	282

Wholesale prices represent unit prices for all farm products. Unit costs are obtained by dividing the index of aggregate costs in each case by the Harvard index of volume of agricultural production. The latter includes crops only, but since the number of livestock has declined through part of the period here covered, it is probable that the inclusion of animal products would tend to heighten rather than lower the rise in unit costs.

[1] Based on Economic Data on Agricultural Situation submitted by David Friday, September, 1925, Exhibit No. 36, Rate Structure Investigation, Interstate Commerce Commission, Docket 17,000.

[2] Based on data from U. S. Bureau of the Census, Harvard Economic Service, and *Commercial and Financial Chronicle*. Capital costs include interest, at prevailing rates for time loans, on operators' investment.

[3] Based on data from U. S. Bureau of the Census, U. S. Department of Agriculture, and Harvard Economic Service. Labor costs include returns for operators' labor at prevailing rates for hired labor.

[4] Based on data from U. S. Bureau of the Census, and Interstate Commerce Commission, *op. cit.* Based on wholesale prices of non-agricultural products, weighted by total workers and improved acreage.

[5] Weighted on basis of relative importance of elements of cost, 1909–13, derived from Table 15.

TABLE B: TREND OF AVERAGE ANNUAL REAL LABOR EARNINGS, AGRICULTURE AND OTHER OCCUPATIONS, 1914–1925

	Index of Annual Return for all Farmers' Labor[1]	Index of Cost of Living of Farmers[2]	Index of Real Labor Earnings per Farmer	Index of Real Annual Earnings per Worker in Other Occupations[3]
1914	100	100	100	100
1915	106	101	105	102
1916	122	112	109	104
1917	184	137	134	99
1918	259	163	159	104
1919	294	185	159	104
1920	100	223	45	106
1919–20	215	200	108	105
1920–21	115	204	56	110
1921–22	81	163	50	115
1922–23	117	158	74	119
1923–24	133	165	81	122
1924–25	159	164	97	122

[1] Based on col. 12 of Table 15, and col. 16 of Table 16.

[2] Based on National Industrial Conference Board's indices of changes in the retail prices of food, clothing, fuel and light and sundries consumed by wage earners' families in communities of all sizes, weighted according to the relative amounts expended on purchases of these items by farmers in recent years, as shown by surveys of the living costs of farm families made by the Department of Agriculture. It is recognized that the food purchased by farm families is not identical in kind with that purchased by urban workers.

[3] Based on Paul H. Douglas, *op. cit.* Includes annual earnings of employed workers in manufacturing industries, transportation, clerical workers in transportation and manufacturing, clergymen, teachers, postal and government employees.

Table C: Index Numbers of Prices Received by Farmers and of Major Elements of Cost, 1914–1925

(1914=100)

	Farm Prices, 30 Items[1]	Farm Wages[2]	Interest on Indebtedness per $1,000 of Property Value[3]	Taxes on Farm Property per $1,000 of Value[4]	Prices of Commercial Fertilizer[5]	Prices of Farm Implements and Repairs[6]	Building Costs[7]	Cost of Living of Farmers[8]	Composite Costs[9]
1914	100	100	100	100	100	100	100	100	100
1915	98	101	105	109	112	100	102	101	102
1916	115	111	106	113	116	103	117	112	111
1917	173	138	110	117	137	126	141	137	133
1918	196	174	116	115	167	144	155	163	156
1919	205	203	122	112	181	144	182	185	174
1920	201	235	130	125	190	152	240	223	205
1921	114	148	155	171	151	147	184	164	160
1922	122	144	166	190	130	127	181	155	155
1923	132	164	165	201	120	136	200	162	163
1924	131	164	156	211	118	139	200	160	162
1925	144	166	154	212	125	135	202	169	168

[1] U. S. Department of Agriculture, *The Agricultural Situation*, February 1, 1926.

[2] U. S. Department of Agriculture, *Crops and Markets*, Monthly Supplement, February, 1926.

[3] Based on L. M. Graves, *op. cit.*, for 1914–1920 and Table 16 for 1919–20 to 1924–25. Averages of crop years have been used as representative of calendar years.

[4] From Tables 15 and 16. Averages of crop years have been used as representative of calendar years.

[5] Based on U. S. Department of Agriculture, Yearbooks, 1923, p. 1151 and 1924, p. 1124. Index represents prices paid by farmers. For 1914–1922 prices per ton of commercial fertilizer are used. For 1923, 1924 average prices per ton of acid phosphate, kainit, limestone, muriate of potash and nitrate of soda are used. Index for 1925 is average of first three quarters.

[6] This index is based on data supplied by the International Harvester Company, which cover about 20% of the domestic business in farm implements in the United States. It represents the average for the year of prices to dealers of all farm implements, including tractors and repairs, but excluding binder twine and motor trucks, weighted by the volume of domestic sales of each type of implement during the past three years. It is probable that the relatively greater weight of tractors in the sales of recent years as compared with the base year tends to make the index lower than would be the case if only a few standard implements of relatively constant use and uniform type throughout the period were taken as the basis. Cf., for example, S. F. Warren and F. A. Pearson, "The Agricultural Situation," p. 269, in which an index of prices of ten typical farm machines is used, and which shows a considerably different price movement. The International Harvester Company's index, however, reflects changing standards and is more comprehensive.

[7] Index of building costs computed by the National Industrial Conference Board on the basis of wholesale prices of building materials and wage rates of building labor.

[8] See Table B, footnote 2.

[9] Items weighted on the basis of estimates of expenditures in 1919, derived from National Bureau of Economic Research, "Income in the Various States," *op. cit.*, Tables 15 and 16 and data on p. 103.

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